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THE UNIVERSITY OF ALBERTA

A COMPARATIVE ANALYSIS OF THE ORGANIZATIONAL  
STRUCTURES OF SELECTED POST-SECONDARY  
EDUCATIONAL INSTITUTIONS

BY



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THE UNIVERSITY OF ALBERTA  
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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled A COMPARATIVE ANALYSIS OF THE ORGANIZATIONAL STRUCTURES OF SELECTED POST-SECONDARY EDUCATIONAL INSTITUTIONS submitted by John Franklin Newberry in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

Date .September.17.,. 1971 . . . . .





## ABSTRACT

The purposes of this study were; (1) to describe the organizational structures of the one-year and two-year post-secondary educational institutions in Alberta and British Columbia; (2) to investigate relationships between the structures and selected variables inside the institutions and in the task environment which may influence structure; and (3) to test the applicability of the multidimensional approach for studying structure, developed in the Aston studies, in educational institutions.

The data were gathered in interviews with the chief executive officers in twenty-three colleges and technological institutes. Twelve structural and thirty contextual variables were used.

Wide variations were found among the institutions on all twelve structural variables. Factor analysis was applied to eleven of the structural variables, revealing two factors or underlying dimensions of structure. The first factor, Behavior Control, related to measures which increase the predictability of the behavior of the participants, such as standardized procedures and centralized decision making. The second factor, Role Structure, was concerned with the shape, in a topological sense, of the role structure of the organization, and with the degree of functional specialization.



Differences were found among the institutions on all thirty contextual variables. The contextual variables were generally found to vary independently.

Strong relationships were found between the structural dimensions and some contextual variables. Eight contextual variables, including three measures of size and the number of programs offered in the institution, were positively related to the Behavior Control dimension. Only two contextual variables, which were concerned with institutional response to requests to include programs and the number of technological innovative practices such as team teaching used in the institutions, were associated with the Role Structure dimension.

The major methodological conclusion of the study was that the multidimensional approach used is applicable to the study of the organizational structures of small institutions which serve the same or similar functions.





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## TABLE OF CONTENTS

	Page
LIST OF TABLES . . . . .	ix
LIST OF FIGURES . . . . .	xi
Chapter	
1. INTRODUCTION . . . . .	1
PURPOSE OF THE STUDY . . . . .	2
ORGANIZATIONAL STRUCTURE . . . . .	3
THE CONTEXT OF STRUCTURE . . . . .	5
POST-SECONDARY EDUCATIONAL INSTITUTIONS .	6
OUTLINE OF THE THESIS . . . . .	7
2. ORGANIZATIONAL STRUCTURE: THEORY AND RESEARCH . . . . .	8
WEBERIAN BUREAUCRACY . . . . .	8
APPROACHES TO STUDY AND RESEARCH ON BUREAUCRACY . . . . .	10
DIMENSIONAL STUDIES OF BUREAUCRACY . . .	11
THE ASTON STUDIES . . . . .	15
ENVIRONMENTAL CONTINGENCIES AND CONSTRAINTS . . . . .	25
RESEARCH ON THE ORGANIZATIONAL STRUCTURES OF COLLEGES . . . . .	28
SUMMARY . . . . .	29
3. ELABORATION OF THE PROBLEM . . . . .	31
THE STUDY . . . . .	31
EXPLANATION OF TERMS . . . . .	36
DESCRIPTION OF THE SAMPLE . . . . .	45



Chapter	Page
4. RESEARCH METHODOLOGY . . . . .	50
INSTRUMENTATION . . . . .	50
DATA . . . . .	55
DATA SOURCES . . . . .	56
DATA ANALYSES . . . . .	58
5. ORGANIZATIONAL STRUCTURE . . . . .	68
STRUCTURAL VARIABLES . . . . .	68
STRUCTURAL PROFILES . . . . .	70
RELATIONSHIPS BETWEEN STRUCTURAL VARIABLES . . . . .	73
FACTOR ANALYSIS OF STRUCTURAL VARIABLES .	76
COMPARISON OF ASTON FACTORS AND FACTORS IN THIS STUDY . . . . .	80
STRUCTURAL PROFILES USING FACTOR SCORES .	83
SUMMARY . . . . .	84
6. THE CONTEXT OF ORGANIZATION STRUCTURE . .	88
CONTEXTUAL VARIABLES . . . . .	88
INTERCORRELATIONS OF CONTEXTUAL VARIABLES . . . . .	90
SUMMARY . . . . .	102
7. RELATIONSHIPS OF STRUCTURE AND CONTEXT . .	104
RELATIONSHIPS BETWEEN STRUCTURAL VARIABLES AND CONTEXTUAL VARIABLES . .	104
RELATIONSHIPS BETWEEN STRUCTURAL DIMENSIONS AND CONTEXTUAL VARIABLES . .	114
SUMMARY . . . . .	117



Chapter	Page
8. SUMMARY, CONCLUSIONS AND IMPLICATIONS . . .	119
SUMMARY . . . . .	119
CONCLUSIONS . . . . .	123
IMPLICATIONS . . . . .	125
BIBLIOGRAPHY . . . . .	128
APPENDIX A. INTERVIEW SCHEDULE . . . . .	136
APPENDIX B. SCALOGRAMS . . . . .	159
APPENDIX C. STRUCTRUE SCORES . . . . .	169





# LIST OF TABLES

Table		Page
1.	Summary of Item Analysis Results . . . . .	63
2.	Means, Standard Deviations and Ranges for Structural Variables . . . . .	69
3.	Normalized Standard Scores for Structural Variables for the Sample . . . . .	71
4.	Product-moment Correlations Between Variables of Structure . . . . .	74
5.	Factor Analysis for Eleven Structural Variables . . . . .	78
6.	Aston Factor Analysis of Nine Structural Variables . . . . .	81
7.	Structural Factor Scores . . . . .	85
8.	Scores on Contextual Variables . . . . .	89
9.	Product-moment Correlations Between Continuous Variables of Context . . . . .	91
10.	Brogden Correlation Coefficients Between Dichotomous and Continuous Variables of Context . . . . .	96
11.	Phi Coefficients for Dichotomous Contextual Variables . . . . .	101
12.	Product-moment Correlations Between Structural Variables and Continuous Contextual Variables . . . . .	105
13.	Brogden Correlation Coefficients Between Structural Variables and Dichotomous Contextual Variables . . . . .	111
14.	Product-moment Correlations Between Structural Dimensions and Continuous Contextual Variables . . . . .	115
15.	Brogden Correlation Coefficients Between Structural Dimensions and Dichotomous Contextual Variables . . . . .	116



Table	Page
16. Scores of Institutions on Structural Variables . . . . .	170
17. Scores on Five Configuration Variables . .	171
18. Responses of Each Institution on Each Decision in the Centralization Scale . .	172



## LIST OF FIGURES

Figure		Page
1.	Structural Profiles with Six Structural Variables . . . . .	72
2.	Structural Profiles Based on Normalized Standardized Factor Scores . . . . .	86



## Chapter 1

### INTRODUCTION

The study of organizational structure is concerned primarily with the regularity and the predictability of behavior within organizations. Researchers and theorists have subjected organizational structure to analysis in an attempt to increase understanding of the behavior of participants. Although this study was concerned with the organizational structures of post-secondary educational institutions in particular, it was closely related to a large body of research which has made significant contributions to the development of organizational theory in general.

Research into organizational structures has been carried out in a variety of organizations including educational institutions. Historically, two major approaches have been used. The first involves comparing institutions to the ideal-type bureaucracy as conceptualized by Weber; the more recent approach involves multidimensional analysis of the structural characteristics of organizations.





## PURPOSE OF THE STUDY

Theory and research have recognized that the structure of institutions is influenced by variables both within the institution and in the task environment. However, the research which has been carried out frequently investigated the relationship of only a single variable such as size to organizational structure.

The purposes of this study were: (1) to describe the organizational structures of the colleges and technological institutes in Alberta and British Columbia; (2) to investigate relationships between the structures and selected variables inside the institutions and in the task environment that may influence structure; and (3) to test the applicability of the multidimensional approach which was developed in the Aston studies for the study of structure in industrial organizations to educational institutions.

This study was expected to make three significant distinct contributions to the study of educational institutions. The first of these possible contributions could be that of furthering comprehensive multidimensional analysis of the interrelationships between organizational structure and variables influencing structure in educational institutions. The second contribution could be that a description of the organizational structures of a particular sample of the colleges and technological institutes would



become available which would make it possible for researchers studying behavior in these institutions to begin to relate variations in behavior to variations in structure. The third contribution could be a demonstration of the applicability of a new multidimensional approach to the study of organizational structure in educational institutions.

The general purpose and anticipated contributions served as objectives which guided the development of the study.

### ORGANIZATIONAL STRUCTURE

If any type of organization is to survive and achieve desired states, certain activities must be performed. Katz and Kahn (1966:86) suggested that these activities include production, maintenance, adaptation, support-seeking, legitimization, coordination and control. In order for such an array of activities to be performed some form of division of labor, the allocation of decision making power, and standardization of procedures tend to develop. These characteristics are elements of organizational structure.

Different organization theorists have defined "organizational structure" in slightly differing ways. Thompson (1967:51) defined structure as the internal differentiation of functions and roles and the patterning of relationships among roles. March and Simon (1958:170)



stated that "Organization structure consists simply of those aspects of the pattern of behavior in the organization that are relatively stable and that change only slowly." Pugh and Hickson (1968:1) have defined structure as "Regularities in activities such as task allocation, supervision and coordination." While there are slight variations in these definitions, there is general agreement that structure refers to deliberate patterning of relationships in organizations.

The specific elements of organizational structure are discussed in detail in subsequent chapters. Some of these elements, drawn from the conceptualizations of Hall (1963a) and of Pugh and his colleagues (1963), are:

1. An Authority Structure which is the locus of decision making for organizationally relevant decisions;
2. Rules which are intended to regulate the behavior of participants and thereby increase the predictability of their behavior;
3. Standardized Procedures which are established to provide uniform methods for solving recurring problems and again to increase predictability;
4. Specialization of Function which involves different roles for individuals performing different functions in the organization;
5. Formalization which refers to the recording of decisions, orders, rules and memoranda and filing these documents.

These elements provide a general orientation to the concept of structure adopted for this study.



## THE CONTEXT OF STRUCTURE

Organizations exist and function within an environment which presents contingencies and imposes constraints; these conditions have a general influence on the organization. Characteristics internal to the organization itself influence other aspects of the organization and in particular its structure.

Thompson (1967:67-69) has classified some environmental constraints as follows: number of sources of financial inputs; options available to the organization in the selection of clients; sources of manpower and material inputs; and the social composition of the task environment including its supportiveness, homogeneity and stability. Although the constraints obviously must have an impact on the structure and operation of organization, relatively little is known about specific effects under particular circumstances.

Some studies have been undertaken to discover the relationships which exist between environmental variables and organization structure. One example is the work of Lawrence and Lorsch (1969), which will be discussed in Chapter 2. Goslin (1965) analyzed the influence of societal changes such as urbanization and specialization in society on the schools. Goslin related urbanization to development of large schools and school systems which in turn led to the development of large administrative





bureaucracies in education. Specialization in society, according to Goslin, has led to specialization in instruction and in educational programs.

Characteristics of organizations such as size, purpose, origin and ownership have been shown to be related to organizational structure. In this study, both characteristics of organizations such as these and environmental variables were defined as forming the context of structure.

#### POST-SECONDARY EDUCATIONAL INSTITUTIONS

One-year and two-year post-secondary educational institutions were chosen for analysis in this study because of the rapid increase in numbers and size during the decade from 1960 to 1970, and also because of their increasing importance in post-secondary education. In 1970 more than fifty percent of the first year university students in British Columbia were in the public colleges.

Fifteen of the twenty-three institutions in the study were established between 1960 and 1970. The number of institutions continues to grow with the opening of colleges in Edmonton and Victoria scheduled for September 1971. The enrolments also continue to grow; only one institution reported a decline in enrolment from the previous year. Dyck's forecast (1970:95) suggests that further expansion should be anticipated:



By the early 1990's it is likely that the average person will spend half of his lifetime engaged in organized educational pursuits. Consequently it is likely that the demand for post-secondary education will increase sharply over the next three decades, as will the use of leisure time for continuing education.

The increasing significance and prevalence of these post-secondary institutions reinforced the decision to select this particular type of organization for study.

### OUTLINE OF THE THESIS

The second chapter of the thesis reviews the literature on organizational structure and, more particularly, reviews the research on organizational structure and its relationships with contextual and environmental variables. Chapter 3 includes the development of the problem, an explanation of terms and a brief general description of the institutions in the study. The methodology employed in the data collection and analyses is discussed in Chapter 4. The findings regarding the organizational structure, the contextual variables and the relationships of structure and context are presented in Chapters 5, 6 and 7 respectively. The final chapter contains a summary of the study, the conclusions and the implications for practice and for further research.



## Chapter 2

### ORGANIZATIONAL STRUCTURE: THEORY AND RESEARCH

Some general theory about and research on organization provides the point of departure for this study. The purpose of this chapter is to provide the background and theoretical setting of the present study. Consequently the chapter includes a discussion of Weberian formulations on bureaucracy, a discussion of the two lines of study and research based on Weber's ideas, a detailed description of the Aston studies, a discussion of variables in the environment that are believed to influence structure, and a summary of the research on the organizational structures of colleges.

#### WEBERIAN BUREAUCRACY

The insights and formulations of Weber on bureaucracy have provided a starting point for much discussion, theorizing and research on organization. Weber (1947: 333-334) identified the following characteristics of a bureaucratic type of organization.

1. They [administrative employees] are personally free and subject to authority only with respect to their impersonal and official obligations.



2. They are organized in a clearly defined hierarchy of office.
3. Each office has a clearly defined sphere of competence in a legal sense.
4. The office is filled by a free contractual relationship.
5. Candidates are selected on the basis of technical qualifications. In the most rational case, this is tested by examination or guaranteed by diploma certifying technical training, or both. They are appointed, not elected.
6. They are remunerated by fixed salary in money, for the most part with a right to pensions.
7. The office is treated as the sole, or at least primary, occupation of the incumbent.
8. It constitutes a career. There is a system of 'promotion' according to seniority and achievement, or both. Promotion is dependent upon the judgement of superiors.
9. The official works entirely separated from the ownership of the means of administration and without appropriation of his position.
10. He is subject to strict and systematic discipline and control in the conduct of his office.

Weber (1952:24) went on to state that:

. . . the purely bureaucratic type of administrative organization . . . is, from a purely technical point of view, capable of attaining the highest degree of efficiency and is in this sense formally the most rational known means of carrying out imperative control over human beings. It is superior to any other form in precision, in stability, in the stringency of discipline, and in its reliability.

In conceptualizing the characteristics of a bureaucracy, Weber drew on his observations of existing organizations. He selected those characteristics that he viewed as maximizing rationality and efficiency, as





compared with the alternatives which he considered, and generated an ideal-type of organization. He recognized that no organization would duplicate this ideal.

The characteristics that Weber conceptualized were concerned chiefly with the administrative structure; little attention was given to the incumbents. Considerations such as informal group relationships and motivation other than through monetary rewards were absent. Subsequent research, to be discussed later, demonstrated dysfunctions which arise in organizations approximating Weber's ideal-type.

#### APPROACHES TO STUDY AND RESEARCH ON BUREAUCRACY

The discussion, theorizing and research related to Weber's formulations can be classified into two general approaches. One approach, the ideal-type approach, involves comparing organizations to the ideal-type and then either generating new types or demonstrating the existence of problems in Weber's formulations. Gouldner (1954:186-187) identified three types of bureaucracy: mock, representative and punishment-centered. Gerth (1952:100-101) saw the Nazi party in Germany as a fusion of charismatic and totalitarian bureaucratic elements to form a new type.

Merton, Gouldner and Selznick (March and Simon, 1958:37-46) have each examined Weber's model and pointed out dysfunctions. Merton and Gouldner were concerned with



the effects of bureaucratic rules on behavior. The former saw rules as leading to rigidity of behavior while the latter believed that rules would reduce performance to acceptable minima. Selznick saw delegation of authority as leading to bifurcation of interests which produced difficulty with clients.

The second approach to studying the bureaucratic characteristics of organizations uses various dimensions. Rather than viewing bureaucracy as a type of organization and classifying organizations as bureaucratic or non-bureaucratic, researchers using this second approach attempt to conceptualize the characteristics of bureaucratic organizations as dimensions and then describe organizations in terms of a set of dimensions.

#### DIMENSIONAL STUDIES OF BUREAUCRACY

Hall (1963a:32) recognized weaknesses in the studies of bureaucracy in organizations that depended upon comparing organizations to Weber's ideal-type. He believed that a fruitful approach to the study of bureaucracy would be to conceptualize characteristics of bureaucracy as continuous dimensions and to measure the position of each organization on each of these continua. To carry out his research, he developed an instrument to measure six bureaucratic dimensions. He stated (1963a:33):



Six dimensions were chosen for use in this study on the basis of frequency of citation and theoretical importance. They are:

1. A division of labor based upon functional specialization.
2. A well-defined hierarchy of authority.
3. A system of rules covering the rights and duties of positional incumbents.
4. A system of procedures for dealing with work situations.
5. Impersonality of interpersonal relationships.
6. Promotion and selection for employment based upon technical competence.

Hall developed Likert-type scales to measure each of these dimensions and gave the instrument to employees in ten organizations. He found that it was possible to consider the dimensions as continua and further, that the dimensions were related to some extent but were sufficiently different to merit considering them as independent. He also discovered that one dimension, Technical Competence (as a basis for promotion), was negatively related to the other dimensions. These findings supported Hall's belief that studying bureaucracy in terms of dimensions that were continuous would be fruitful. Further, the findings cast doubt on the usefulness of a unitary concept of bureaucracy.

Hall (1963a) also attempted to determine whether size and age of the organizations were associated with patterns of profiles based on the dimensions. Neither size nor age was associated with any of the dimensions.



MacKay (1964), at The University of Alberta, applied Hall's instrument (with some modifications) to schools. A number of subsequent Hall-type studies, including those of Robinson (1966), Mansfield (1967), Kolesar (1967) and Punch (1967), related bureaucratic characteristics of schools and school systems to various other factors such as professionalism, communication and pupil alienation.

MacKay, Robinson, Kolesar and Punch all used Hall's instrument, with various minor modification. Differences in the bureaucratic dimensions among schools were found in all of the studies. MacKay found that Technical Competence was significantly negatively related to the other five dimensions. Robinson obtained similar results and also found that Specialization was positively related to Technical Competence but negatively related to the remaining four dimensions (Hierarchy of Authority, Rules, Procedural Specification and Impersonality).

Kolesar used factor analysis on the instrument and found that the six dimensions loaded into two factors. Kolesar referred to the factor on which Hierarchy of Authority, Rules, Procedural Specifications, and Impersonality loaded as the Authority Dimension and the other factor as the Expertise Dimension. Mansfield's study was based on an instrument that measured the four dimensions in Kolesar's Authority Dimension.





Two observations can be made about the research which adopted a dimensional approach to the study of bureaucratic structure. First, the limitations of a unitary concept of bureaucracy became evident. Viewing bureaucratic characteristics as continuous dimensions upon which organizations can be placed is a more fruitful approach to the study of organizations. The second observation is that the dimensions tend to cluster into two groups, one concerned with control of behavior and the other concerned with the basis for promotion and, to a lesser extent, functional specialization.

Hage and Aiken (1967) undertook a study to determine how the distribution of power to make decisions affects the formalization and complexity of an organization's social structure. They factor analyzed Hall's scales to find measures of hierarchy of authority and two indicators of formalization; these measures were job codification and rule observation. Complexity was indicated by three measures which were the number of occupational specialities, the degree of professional training and the amount of professional activity. Hage and Aiken (1967:88) found that control over resources was a better predictor of other organizational properties than was control over work decisions. Further, they found that decentralization of decisions on the allocation of resources was strongly associated with the complexity of the organization. Hage and Aiken, concluded (1967:90) that "Complex organizations



are more likely to be decentralized, . . . the occupants of many positions make decisions, while formal organizations are likely to be more centralized." That is, organizations with many professionals as employees are more likely to be decentralized than organizations with few or no professional employees.

### THE ASTON STUDIES

The Aston studies, named after the University of Aston in England, were conducted in the period from 1963 to 1968. The overall aim, according to Pugh (1963:292), was to:

. . . generalize and develop the study of work organizations and behavior into a consideration of the interdependence of three conceptually distinct levels of analysis of behavior in organizations: (1) organizational structure and functioning, (2) group composition and interaction, and (3) individual personality and behavior [and to] interrelate each of these levels.

Heady (1959) discussed confusion in research on bureaucracy and suggested that researchers should distinguish between variables of structure and variables of behavior to avoid such confusion. He proposed that bureaucracy be defined in terms of certain essential structural characteristics that are already generally accepted and understood and then to carry out research on behavior in bureaucratic organizations with a view of developing a classification of organizations based on variations in behavior.



The Aston researchers followed Heady's suggestion and made a distinction between structural and behavioral variables. They chose to study structural variables such as the amount of functional specialization and the extent of provisions for standardization of procedures. They did not study variables of behavior such as the prescribed nature of the relationships between employees. The Aston researchers viewed the failure to distinguish between structural and behavioral variables as resulting in a lack of rigor which has led to errors such as the suggestion by Blau (1956) and Presthus (1965) that large size is a characteristic of bureaucracy in organization.

In summary, Pugh and his colleagues stated (1963: 297-298):

It is clear that what is now required is, in the words of Presthus (1959:25), 'an explicit synthesis between conceptual theory and empirical field research.' Thus we have attempted to develop an empirically based multidimensional analysis of the structural variables of organization.

#### Aston Structural Variables and Dimensions

The structural variables used in the Aston studies were based on Bakke's (1959) analysis of the processes and activities in work organizations. Pugh and his colleagues (1963:300) stated that ". . . an empirical study of the structure of an organization cannot be carried out except in relation to its functioning." The Bakke analysis provided a list of processes of work organizations. Pugh et al. (1963:300-301) indicated that the processes





can form a basis for the analysis of organizational activity and provide the groundwork for structural analysis. Thus, for example, it is possible to study structural variables such as specialization in relation to the activities identified in connection with each process.

The structural variables chosen for the Aston studies were drawn from the formulations of Weber. These variables are listed with their definitions (Pugh et al., 1968a:73-79):

1. Specialization. Specialization was concerned with the division of labor within the organization, the distribution of official duties among a number of positions. These activities or functions excluded the workflow activities of the organization.
2. Standardization. Standardization was concerned with legitimized procedures to cover all circumstances.
3. Formalization. Formalization denoted the extent to which rules, procedures, instructions and communications were written down.
4. Centralization. Centralization was concerned with the locus of authority to make decisions affecting the organization.
5. Configuration. Configuration was the "shape" of the role structure in terms of counts of positions and ratios of various classes of employees.

The structural variable used in the Aston studies overlap those of Hall in part. Both have variables concerned with decision making, specialization and standardization of procedures. However, the Aston researchers and Hall differed in that the former included a variable concerned with documents (Formalization) and Hall included





variables concerned with bases for promotion and prescriptions of interpersonal relationships.

Pugh and his colleagues at Aston developed an interview schedule consisting of sixty-four scales and subscales. The data were gathered through interviews with the chief executive officers and other senior officials in fifty-two work organizations in Birmingham. The organizations were diverse in purpose ranging from very large manufacturing firms to the Birmingham school system. The size of the organizations ranged from 250 employees to 25,000 employees.

The method of data collection in studies of bureaucratic characteristics presents a problem. At least three methods of data collection are feasible: (1) interviewing the chief executive as in the Aston studies, (2) giving questionnaires to employees as in the Hall study and (3) direct observation by a researcher. Each method could yield a different description of the organization and of its structural characteristics.

The Aston researchers chose the interview technique but recognized the problem and stated that the information they gathered was (Pugh et al., 1968b:69):

. . . what is officially expected should be done and what is in practice allowed to be done; it does not include what is actually done, that is, what "really" happens in the sense of behavior beyond that instituted in organizational forms.



Hall (1963a:35) recognized the same problem and chose to gather his information based on the perceptions of the participants; that is, he used questionnaires. His reasoning (Hall, 1963a:35) was that:

. . . perceptions of the participants may well be at variance with the officially prescribed structure. The official structure, however, is only as important as the degree to which it is adhered to. If the actual organizational structure is a replica of the formal structure, then the formal structure is the significant structural component. On the other hand, the degree of variation from the formal structure is the actual significant structure for organizational operation.

However, an examination of the items in the scales used by Hall and those in the Aston studies reveals a further variable. Hall's scales, particularly some items, appear to measure attitudes in addition to perceptions while the Aston scales seem to be seeking more objective data. An example from the scales on both instruments concerning decision making illustrates this distinction. One item from Hall's instrument is "I feel that I am my own boss in most matters." An item from the Aston instrument is "Who makes the decision on the type and brand of equipment to be purchased?" The Hall item is seeking the respondent's attitude while the Aston item is seeking fact. However, the "fact" is still a subjective interpretation of actual events by a particular individual.

The scales used in the Aston studies were tested for scalability using Guttman scalograms and item analysis



involving the Brogden coefficient (Levy and Pugh, 1969). Standard scores were calculated and structural profiles were formed for each organization in the study. Factor analysis was performed on the structural scales and subscales to determine whether there existed underlying dimensions of structure. Four factors were found which were named and defined as follows (Pugh et al., 1969a:92):

1. Structuring of Activities. This factor was concerned with the degree to which the intended behavior of employees was overtly defined by task specialization, standard routine and formal paper work.
2. Concentration of Authority. This factor was concerned with the degree to which authority for decisions rested in the controlling units outside the organization and was centralized at the higher levels within it.
3. Line Control of Workflow. This factor was concerned with the degree to which control was exercised by line personnel instead of through impersonal procedures.
4. Supportive Component. This factor was concerned with the amount of activity auxiliary to the main workflow of the organization.

The first two factors were well defined but the other two were weaker. The decision was made by the Aston researchers to drop Factor IV, Supportive Component, from further analysis. Factor scores for the organizations were calculated and standardized, and structural profiles were compiled. These profiles showed clear differences in the bureaucratic characteristics of the organizations studied.



### Aston Contextual Variables

The second phase of the Aston studies was an examination of the context within which the structure of an organization was embedded. Pugh and his colleagues stated (1969a:91):

The structure of an organization is closely related to the context within which it functions, and much of the variation in organizational structure might be explained by contextual factors. Many such factors, including size, technology, organization charter or social function and interdependence with other organizations, have been suggested as being of primary importance in influencing the structure and function of an organization.

The importance of contextual variables in organizations has been recognized and emphasized by many researchers and scholars. Etzioni (1964) emphasized the importance of goals (charter) to an organization. Other researchers have studied contextual variables in relation to organizational structure but have taken a unitary as opposed to a multivariate approach. That is, they have viewed a single variable such as size as being most important in determining or at least influencing structure. Some examples are: Woodward (1965) who emphasized the influence of technology, Presthus (1958) who studied size, Parsons (1956) who emphasized social function or charter and Eisenstadt (1959) who studied interdependence. The Aston approach (Pugh et al., 1969a:91) was " . . . to relate these [contextual] factors in a comparative systematic way to the characteristic aspects of struc-





ture . . . [employing] a multivariate factorial approach in both context and structure."

The contextual variables and their definitions were as listed below (Pugh et al., 1969a):

1. Origin and History. This variable included both the age of the organization and whether the organization was entrepreneurial or government sponsored.
2. Ownership and Control. This variable included the degree of public accountability and the relationship of ownership and management.
3. Size. This variable was defined as the number of employees, net assets and number of employees in the parent organization.
4. Charter. This variable was concerned with two aspects, the goals of the organization and the self image of the organization.
5. Technology. Technology was defined as the sequence of physical techniques used on the workflow of the organization.
6. Location. This variable was concerned with the number of operating sites of the organization.
7. Dependence. This variable was concerned with the interdependence of the organization with other organizations. Included were such characteristics as number of specialisms contracted out and integration with suppliers.

#### Relationships of Structure and Context

Correlations between the contextual variables and the dimensions, Structuring of Activities, Concentration of Authority and Line Control of Workflow, were calculated. It was found (Pugh et al., 1969a:109) that Size correlated most highly with Structuring of Activities ( $r = .69$ ) while



Dependence had the highest correlation with Concentration of Authority ( $r = .66$ ). The Aston researchers then carried out multiple regression analysis to determine which contextual variables were the best predictors of the structural factors.

Pugh and his colleagues (1969a:111) concluded that:

This study has demonstrated the possibilities of a multivariate approach to the analysis of the relationships between the structure of an organization and the context in which it functions.

. . . . .

The predictability of the structural dimensions from contextual elements serves as external validating evidence for the structural concepts themselves. It has been shown that besides being internally consistent and scaleable, as previously demonstrated, they can also be related in a meaningful way to external referents.

#### Abbreviated Replications of the Aston Studies

The results of the original Aston study indicated that the approach and methodology that had been developed were useful. However, the size of the interview schedule necessitated a large expenditure of time both in data collection and data processing. Therefore, the Aston researchers decided to attempt to develop an abbreviated format (Inkson et al., 1970a). A short form interview schedule was developed using only those scales involved in the two strongest structural dimensions which were Structuring of Activities and Concentration of Authority. Similarly, the contextual scales used were those having the highest power of prediction, namely Dependence and



Workflow Integration (Technology). The short form was used to rework the data from the original full study. The following correlations were obtained between the corresponding factors on the original study and on the abbreviated replication (Inkson et al., 1969a:4).

<u>Context</u>		<u>Structure</u>	
Workflow Integration	0.96	Structuring of Activities	0.97
Dependence	0.91	Concentration of Authority	0.93

The short form interview schedule was used in a study of industrial organizations in Ohio (Inkson et al., 1970b) and on industrial firms in Toronto (McMillan et al., 1970). The same two structural and two contextual factors that emerged in the original abbreviated replication were found in the applications of the short form instrument in both Ohio and Toronto.

#### Aston Studies on Similar Organizations

All of the Aston studies mentioned have been done on samples which consisted of diverse organizations or diverse industrial organizations. The only application of the Aston approach to a set of organizations serving a similar function was Tauber's study (1968) of six hospitals in the Birmingham area. She found that all of the hospitals had very similar organizational structures. Whether this finding was caused by a lack of discriminating power of the instruments or whether the organizational



structures were highly similar since the hospitals were all under the National Health Scheme was not determined.<sup>1</sup>

#### ENVIRONMENTAL CONTINGENCIES AND CONSTRAINTS

With the development of the system concept, that is, the recognition of interrelationships between parts of an organization and between the parts and variables in the environment, organization theorists such as Parsons (1964) began to stress the importance of the influence of environmental variables on organizations. Yet, Carlson (1964:262) was able to state that "The area of organization-environment relations, however, is one of the least developed areas in the study of organization."

Blau and Scott (1962) summarized much of the work completed on organization-environment relationships prior to 1962 and stressed both the interdependence and reciprocal influence of organizations and their environments. A recent study by Lawrence and Lorsch (1969) was designed to discover how different environmental variables affect the organizational structures of firms in three different industries. They found differences in terms of differentiation and integration of function and in conflict resolution, depending upon environmental characteristics,

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<sup>1</sup>Personal communication from Professor D.S. Hickson.





in scientific, market and techno-economic areas. More specifically, Lawrence and Lorsch (1969:157-158) found that:

. . . the state of differentiation in the effective organization was consistent with the diversity of the parts of the task environment, while the state of integration achieved was consistent with the environmental demand for interdependence.

. . . . .

The locus of influence to resolve conflict is at a level where the required knowledge about the environment is available. The more unpredictable and uncertain the parts of the environment, the lower in the organizational hierarchy this tends to be.

Pugh and his colleagues recognized that there were variables which would probably influence structure but these variables were, at least partly, within the organization. Some of the Aston contextual variables such as Size, Age and Charter form a level of analysis between the organizational structure and the environment.

Thompson (1967) listed the varieties of environmental constraints which he found in the literature. The number of sources of financial inputs will influence an organization. If an organization must depend completely on one funding agency, such as a state or provincial government, then the organization will have less latitude than if it has alternate sources of funding. A second constraint is a lack of option in selecting clients. If an organization, particularly a service organization, cannot select its clients, then the programs that it wishes to offer may be constrained.



The supply of manpower and the social composition of the environment are two other constraints that Thompson conceptualized. If the demand for manpower exceeds the supply, the operations or at least the effectiveness of an organization may be curtailed. The supportiveness, stability and homogeneity of the environment can each influence an organization. If the environment is not supportive, then the organization may cease to exist. Should the environment be unstable, the organization would have to be highly flexible. The homogeneity of the environment will influence the variety of programs that an organization can undertake.

Some analysis and research has been done on the relationship of colleges to their environments. Blocker and his colleagues (1965) devoted a chapter of their book, The Two-Year College: A Social Synthesis, to an analysis of the social milieu of the college. They stressed the importance of the relationships of the college and the various communities which it was intended to serve.

Clarke's case study (1960) of San Jose Junior College illustrated the impact of certain aspects of the task environment on a college. This college had a completely open-door admissions policy. The lack of option of the college with respect to student admissions was a significant factor. Clarke (1960:138) reported:



But overall the college is directly shaped by virtually unlimited student choice of admission and participation. As a result, the size and composition of the student body and the shape of the college's programs are not in an important sense controlled or consciously determined by anyone.

## RESEARCH ON THE ORGANIZATIONAL STRUCTURES OF COLLEGES

Several studies of the organizational structures of colleges have been conducted in the United States. Burnette (1966) in a study of nine junior colleges in Florida found that the President's office tended to be structured bureaucratically and that the colleges tended to be more bureaucratic than collegial in structure. Eisenbise (1963) conducted a study of the administrative organizations and operational patterns of sixty-one colleges in California using a structured interview technique. He found confusion in organizational structures designed to control academic matters. Pax (1963) conducted a study of the administrative structures of California colleges. He found that although administrators agreed with principles of administration, such principles were not being employed in practice. Smith (1968) conducted a study of colleges in Texas relating structural dimensions as measured by the Hage and Aiken instruments to organizational climate. He found that the colleges in his sample were in two groups according to their structural configurations and that there were differences in the climates between the groups.



## SUMMARY

Weber provided the point of departure for studies in bureaucracy by enumerating a set of characteristics, both structural and behavioral, which, if achieved by an organization, would result in maximum technical efficiency and rationality. Early research tended to accept the set of characteristics as an ideal-type and organizations were compared to the ideal.

Hall conceptualized a set of Weber's characteristics as being continuous dimensions. Through empirical research Hall found that organizations could be placed on each dimension and then could be described in terms of a profile. Hall's finding that the dimensions were somewhat independent cast doubt upon the unity of Weber's ideal-type.

Heady recognized confusion in research on bureaucracy and proposed that structural and behavioral elements be separated. The Aston studies followed Heady's suggestion in that only structural variables were included for study.

The study of the relationships between organizations and environmental variables has followed a similar pattern to that of the study of bureaucracy. Early researchers studied a single environmental variable and its relationship to structure. The Aston researchers developed a multivariate approach which they used in the





study of structural variables, variables that influence structure and the relationships between these two sets of variables.



## Chapter 3

### ELABORATION OF THE PROBLEM

The Aston studies were concerned with diverse large organizations; a logical next step appeared to be testing the applicability of the multivariate approach developed in the Aston studies to smaller organizations serving a similar function. The present study tested the applicability of the Aston approach to the study of the organizational structures of colleges and institutes of technology.

### THE STUDY

The problem of this study was (1) to describe the organizational structures of the twenty-three one-year and two-year post-secondary educational institutions in Alberta and in British Columbia using a multivariate approach and (2) to determine whether the structural variables and factors were related to selected contextual variables such as size, age and community support. A subsidiary problem was to test the applicability of the Aston multivariate approach to the study of the organizational structures of educational institutions.

This study was exploratory in that it met the criteria for exploratory studies set forth by Kerlinger



(1964:388). These criteria are that the study will seek to identify variables in the field situation, will seek to discover relations among variables and will seek to lay the groundwork for later more systematic and more rigorous testing of hypotheses. Because the study was exploratory and descriptive, no hypotheses were developed or tested. Rather, the intent was to obtain information relevant to the research questions to be stated and discussed. The specific research questions are presented in the following sections.

### Structural Variables

Five major variables of structure were used in this study. The variables were: Specialization, Formalization, Standardization of Procedures for Selection and Advancement, Centralization and Configuration. Some of these major variables included sub-variables. Formalization included Documents and Recording of Role Performance. Centralization included Autonomy. Configuration included five sub-variables: Chief Executive Span, Subordinate Ratio, Percentage of Clerks, Percentage of Non-workflow Personnel and Percentage of Superordinates. Differences among the institutions on these variables were expected since differences on these or similar variables have been found in the Aston studies (Pugh et al., 1968b) and in the studies of the bureaucratic characteristics of schools conducted by MacKay (1964)



and others described earlier.

This study provided information relevant to the following question.

1. What variations exist among the institutions in the study on the structural variables:  
Specialization, Formalization, Standardization of Procedures for Selection and Advancement, Centralization and Configuration?

### Structural Dimensions

Pugh and his colleagues (1968b) performed factor analysis on their structural data and found four underlying dimensions of structure, the fourth being very ill-defined. Subsequent studies (Inkson et al., 1970a; Inkson et al., 1970b; McMillan et al., 1970) using the short form of the Aston interview schedule have consistently found a Structuring of Activities factor and a Concentration of Authority factor.

All of the structural scales in the abbreviated form of the Aston interview schedule were retained for this study albeit with some alterations. Further, a number of items and subscales were reintroduced from the original full Aston interview schedule in an effort to determine whether three factors or dimensions of structure could be found. A fuller discussion of the changes in the instrument is included in Chapter 4.





No expectations were held regarding whether the structural factors found in this study would be the same as the factors that have been found consistently in the original Aston study and in the abbreviated replications in Ohio and in Toronto. The consistency of the factors found in the original study and the abbreviated replications may be partly explained by the fact that the samples in both the Ohio and the Toronto studies were matched with organizations in the original study so that cross-cultural comparisons could be made. Different structural factors may be found in this study because of the lack of similarity in size and institutional purpose between the institutions in this study and the samples in the Aston studies.

This study provided information relevant to the following questions.

1. Do the scores on the scales Formalization, Specialization and Chief Executive Span cluster to form a factor similar to the one in the Aston studies called Structuring of Activities?
2. Do the scores on the scales Autonomy, Centralization and Percentage of Superordinates cluster to form a factor similar to the one in the Aston studies called Concentration of Authority?



3. Do the scores on the scales Subordinate Ratio, Percentage of Clerks, Percentage of Superordinates, Recording of Role Performance and Standardization of Procedures in Selection and Advancement cluster to form a factor similar to the one in the original Aston study called Line Control of Workflow?

### Contextual Variables

The broad contextual variables used in this study included Origin and History, Ownership and Control, Size, Charter, Technology, Dependence and Location. These were some of the contextual variables that were used in the Aston studies and were found to have been related to structure. For this study, certain other variables which were more directly concerned with the task environment of the institutions were included. These variables were suggested by Thompson (1967:67-69) and include Number of Financial Inputs, Option in Selection of Students, Manpower, Stability of the Environment and Community Support.

This study provided information relevant to the following question.

1. What variations exist among the institutions in the study on the contextual variables:  
Origin and History, Ownership and Control,  
Size, Charter, Technology, Location, Dependence,  
Option in Selection of Students, Number of



## Financial Inputs, Manpower, Stability of the Environment and Community Support?

### Relationship of Structure and Context

Pugh and his colleagues (1969a:109) found that certain contextual variables and structural factors were highly correlated either positively or negatively. For example, Size and Structuring of Activities were positively correlated ( $r = .69$ ). In this study relationships were explored between structural factors and contextual variables. Further, relationships were sought between structural variables and contextual variables.

This study provided information relevant to the following questions.

1. What relationships exist between the structural variables and the contextual variables?
2. What relationships exist between the structural factors and the contextual variables?

### EXPLANATION OF TERMS

#### Organizational Structure

This was considered to be the internal differentiation of functions and roles and the patterning of the relationships among roles in organizations.

#### Structural Variables

Structural variables were those variables defined by Pugh and his colleagues (1963:1968b) and measured by



their instruments. The definitions for each of these variables is presented in the following paragraphs.

Specialization. This was concerned with the division of labor in an organization. Specifically, for the Aston studies and the present study, specialization referred only to specialization in non-line functions; that is, in support functions such as clerical and maintenance services.

Formalization. This was concerned with the extent to which procedures, rules, communications and instructions were written and filed. Two scales were used to indicate the degree of formalization.

1. Documents. This referred to the extent that documents exist to prescribe roles.
2. Recording of Role Performance. This referred to the extent that performance was recorded.

Centralization. This was concerned with the locus of decision-making in both policy and operational areas. Two subscales were used to indicate the degree of centralization.

1. Centralization. This was concerned with the extent to which decision making power was concentrated at or near the top of the role structure of the institution.





2. Autonomy. This was concerned with the extent to which institutionally relevant decisions were made outside the institution.

Configuration. This was concerned with the shape, in a topological sense, of the role structure of the institution. It was indicated by five measures.

1. Chief Executive Span. This was the number of employees reporting directly to the chief executive officer.
2. Subordinate Ratio. This indicated the average number of instructional personnel reporting to each immediate superordinate (e.g. department chairman).
3. Percentage of Clerks. This indicated the percentage of the total employees engaged in clerical duties.
4. Percentage of Non-workflow. This indicated the percentage of employees not involved in instruction or educational administration as opposed to business administration.
5. Percentage of Superordinates. This indicated the percentage of employees in full-time equivalents involved in educational administration. The administrative time of department chairmen was included.



Standardization of Procedures for Selection and Advancement. This referred to the extent that routines and procedures had been established for the selection and promotion of personnel.

Underlying Dimensions of Structure

The underlying dimensions of structure were those found by Pugh and his colleagues (1968b) through factor analysis of the structural data secured in their study. In addition to an explanation of each of the factors (Pugh et al., 1969a), the scales and subscales which loaded most heavily on each factor are named.

Structuring of Activities. This factor was concerned with the degree that the behavior of the employees was overtly defined by task specialization and standard routines. Scales with high loadings on this factor were: Formalization, Specialization, Chief Executive Span and Vertical Span.

Concentration of Authority. This factor was concerned with the degree to which authority to make decisions rested either at the top of the hierarchy or outside of the organization. Scales with high loadings on this factor were: Autonomy (negative), Centralization and Percentage of Superordinates.



Line Control of Workflow. This factor was concerned with the degree to which control was exercised by line personnel instead of through impersonal procedures. Scales with high loadings on this factor were: Subordinate Ratio (negative), Percentage of Superordinates, Percentage of Clerks, Recording of Role Performance (negative) and Standardization of Procedures for Selection and Advancement.

### Contextual Variables

The contextual variables were selected variables which were believed to influence the organizational structure of institutions. The contextual variables used in this study are listed and defined.

Origin and History. This included two variables.

1. Founding. This indicated whether a founder could be named and whether this individual was still active with respect to the institution.
2. Age. This indicated the number of years that the institution had been in operation.

Ownership and Control. This referred to the type of unit that controls the institution and was indicated by a single variable.

1. Type of Control Unit. This indicated the degree of local representation on the controlling board. The types ranged from locally elected



board members to government departments.

Location. This included two variables.

1. Location. This referred to the province in which the institution was situated.
2. Population. This indicated the population of the normal service area of the institution and the density of the population.

Charter. This was concerned with the purpose and offerings of the institution. Charter was measured by four variables.

1. Number of Programs. This indicated the number of programs offered having at least a one year duration.
2. Flexibility. This indicated whether the institution would put on courses or programs at the request of outside agencies.
3. Open Door. This indicated whether the institution would take in anyone who gives some indication that he could profit from the experience.
4. Program Length. This indicated whether the institution offered programs longer than two years in length.





Technology. This referred to the operations of the institution, with particular reference to those operations affecting the students. Eight variables were used to measure technological characteristics.

1. Variation in Teaching Groups. This indicated the variety of sizes of teaching groups used in the institution.
2. Technical Innovations. This indicated the number of innovative practices such as team teaching that were employed in the institution.
3. Scheduling Block. This indicated the length of each academic session that the institution used. The length was a quarter, a semester or a year.
4. Selection of Students (Interview). This indicated the extent to which the institution relied on interviewing in the selection and placement of students in programs.
5. Selection of Students (Written Tests). This indicated the extent to which the institution relied on written tests in the selection and placement of students in programs.
6. Students to Instructor Ratio. This indicated the average number of students for each instructor; both in full-time equivalents.



7. Students to Administrator Ratio. This indicated the average number of students for each administrator. The administrative time of department chairmen was included.
8. Students to Employee Ratio. This indicated the average number of students for each employee in the institution. Farm staff and residence staff were excluded.

Dependence. This referred to the number of specialized functions that the institution contracted out.

Size. This was indicated by three measures.

1. Size - Administrators and Instructors. This included all administrators and instructional personnel.
2. Size - Employees. This included all non-student employees in the institution.
3. Size - Enrolment. This indicated the student enrolment in full-time equivalents.

Number of Financial Inputs. This referred to the number of sources of financial inputs to the institution that supply at least five percent of the operating budget.

Option in Selection of Students. This indicated whether the institution exercised an option in selecting students based on criteria other than minimum acceptable standing in prerequisite courses.



Manpower. This was concerned with the instructional staff and was measured by three variables.

1. Supply of Instructors. This referred to whether there was an adequate supply of instructors.
2. Turnover. This indicated the annual turnover in the faculty.
3. Education Leave. This referred to whether the institution had assisted educational leave provisions for its faculty.

Stability of the Environment. This referred to the demand for the courses and programs offered and shifts in strength of the demand from one area of offerings to another. Two variables indicated the environmental stability.

1. Enrolment Change. This indicated whether the overall enrolment had increased, decreased or remained unchanged.
2. Direction of Enrolment Change. This indicated whether shifts in proportions of enrolment were moving toward academic or non-academic offerings.

Community Support. This scale indicated the degree of interest shown by the community in terms of influence of outside groups on the institution, assistance to the in-



stitution in terms of advisory committees and other general support, both financial and non-financial.

#### DESCRIPTION OF THE SAMPLE

The study included four types of institutions: public colleges, private colleges, agricultural colleges and technological institutes. This section is a description of some of the similarities and differences among the institutions. The institutions are named in Chapter 4.

The public colleges in both provinces operate under legislation; The Colleges Act (1969) in Alberta and Part XI of The Public Schools Act (1970) in British Columbia. The Alberta agricultural colleges operate under The Agricultural and Vocational Colleges Act (1967). No legislation governs the operations of the technological institutes in either province.

The Alberta public colleges are a unified provincial system operating under the Alberta Colleges Commission. Each college has a board whose members are appointed by the Minister of Education. The local community of a college does not provide direct financial support to the college.

In British Columbia, the public colleges are not regarded as a unified system in the same formal manner that is found in Alberta. The colleges are established, controlled and partly financed locally. To establish a college, the voters in a group of school districts must





pass a referendum approving the establishment of a college. Passing of the referendum indicates a commitment by the voters to pay forty percent of the operating and capital costs of the college. The college council consists of a representative from the school board of each participating school district, the superintendent of one of the participating school districts and some other appointed members. The council members that are also school trustees compose one-half or more of the college council.

The private colleges in the study each have a controlling board appointed by the organization owning the college. Each of the technological institutes and agricultural colleges operates directly under a provincial government official.

The institutions vary in size, in terms of student enrolment in full-time equivalents, from 4469 at Vancouver City College, Langara to 143 at Fairview College. As a group, the technological institutes are largest ranging from 2594 to 3300 students. The public colleges are next in size followed by the private colleges and the agricultural colleges. None of the private or agricultural colleges has an enrolment reaching 500 students. The sizes of each of the institutions is shown in Chapter 6.

The offerings in the public colleges generally involve four areas: university transfer, career, academic upgrading and extension. University transfer programs generally have the largest portion of the enrolment. The



private colleges are primarily concerned with university transfer programs. The technological institutes offer career programs mainly in engineering, business and medicine; some also offer programs in fine arts and communications. The programs in the agricultural colleges are agricultural technologies, home economics and secretarial arts.

The faculties at most of the institutions in the study are very stable and the annual turnover exceeded twenty percent in only four colleges. No other occupation is attracting faculty members away from the institutions. Seventeen of the twenty-three institutions have educational leave plans.

The ratios of students to each instructor, administrator and employee show wide variation. The students to instructor ratios are lowest in the agricultural colleges, the institutes of technology and the private colleges. The ratios for these institutions range between eight and ten students for each instructor. These institutions also tended to have the lowest students to employee ratios. The students to administrator ratios were highest in the public colleges in British Columbia. The three ratios for each institution are shown in Chapter 6.

Two thirds of the institutions operate on a semester system, two colleges operate on a quarter system and the remainder are on an academic year. Technological innovations including team teaching, educational television



and programmed instruction are commonly used in many of the institutions, particularly the larger ones.

Post-secondary educational institutions serve a number of communities including universities, industry and the local community. The colleges in Alberta are all affiliated with the universities; affiliation guarantees transferability of credit for college graduates. In British Columbia, articulation agreements have been made between the colleges and the universities although there is no affiliation. The Alberta agricultural colleges and The University of Alberta have a transfer agreement such that college graduates can enter the Faculty of Agriculture with transfer credits. The technological institutes do not have transfer arrangements with the universities since their purpose is to prepare students for occupations rather than for further training.

Advisory committees consisting of representatives from industry are common. In many institutions there is an advisory committee for each program. These committees serve a number of functions including maintaining liaison with industry to insure relevance for programs, channeling influence and public relations.

Maintaining the support of the community is imperative for any service institution, particularly if the institution is at least partly funded by the local community. All the institutions reported having good support



from the community. The institutions that had conducted drives for funds reported generous support.

The number of sources of financial inputs varied among the institutions. The Alberta public colleges, the institutes of technology and the agricultural colleges each have two sources: government grants and tuition fees. The public colleges in British Columbia have three sources: government grants, tuition fees and local taxes. The private colleges in Alberta receive some government grants and rely on tuition fees and various other sources to cover the balance of their operating costs. The private colleges in British Columbia operate entirely on the funds which they can raise including tuition fees; no grants are made by the provincial government.





## Chapter 4

### RESEARCH METHODOLOGY

The methodology used in this study very closely approximated that of the Aston studies. The reason was that one of the problems of the study was to test the applicability of the Aston approach to relatively small organizations which were similar in function; specifically one-year and two-year post-secondary educational institutions. This chapter includes a discussion of the interview schedule used, the data collection and analyses. A copy of the interview schedule is included in Appendix A.

### INSTRUMENTATION

The instrument used to gather the data for this study was an adaptation of the short form interview schedule, reported by Inkson (1970a), which was developed from the sixty-four scale instrument used in the original Aston study. The construction and testing of the short form instrument was discussed in Chapter 2. Essentially, the short form instrument yields measures of two dimensions (factors) of structure, Structuring of Activities and Concentration of Authority, and selected contextual variables.



For this study, the abbreviated form of the Aston interview schedule was modified in several ways to increase its applicability to the institutions in this study and to investigate environmental variables not studied by the Aston researchers. Further, some structural items and scales which were not on the short form were included to determine whether more than two factors were required to explain variations in structure.

The Aston studies were concerned with diverse types of work organizations whereas this study was concerned only with educational institutions. Further, the majority of the clientele, although certainly not all, fall within the age group from age eighteen to twenty-three. Secondly, the minimum number of employees in the organizations in the Aston studies was 250 and the maximum was 25,000. In this study the number of employees in the institutions ranges from 38 to 639 with the median size being 77. These differences between the Aston organizations and the institutions in this study constitute the reasons for the changes that were made in the interview schedule. The changes made in the instrument are listed.

#### Wording Substitutions

Terms in the instrument that were inappropriate to educational institutions such as "first-line supervisor" were replaced with more appropriate terms such as "department chairman."



### Additions to the Short Form

Centralization. This variable was reintroduced from the sixty-four scale instrument with the expectation that this scale would give more data than the Autonomy scale alone (which is on the short form).

Other scales reintroduced. Since this study was intended to include the three structural factors rather than just two as in the short form, the scales with the highest factor loadings on Factor III, Line Control of Workflow, were reintroduced. These scales were: Recording of Role Performance, Percent of Clerks and Standardization of Procedures Controlling Selection and Advancement.

New items introduced. A small number of selected items were included which appeared particularly pertinent to educational institutions but for which no parallel items were in the short form.

### Redefinitions

Criterion for Specialization. Because of the small size of the institutions in the present study, the criterion was set at a person engaged at least half-time, as opposed to full-time, in the specialized activity in order for the institution to score on a Specialization item.



Location. The location in this study referred to the province in which the institution was located and to the total population of the normal service area.

Ownership and Control. This variable referred to the type of controlling board (elected, appointed) rather than the status of the particular unit under study, as was the meaning in the short form.

### Technology

The Technology scale in the short form was based on Woodward's work in industrial organizations. As such, it was unsuitable for the study of educational institutions. Therefore, a set of items reflecting technological aspects of educational institutions was formed.

### Charter

In the short form interview schedule, the Charter items were concerned with the products of the organization. For this study, it was assumed that the products of an educational institution are students who have graduated from a program possessing certain skills and knowledge. Therefore, the programs offered by the institution were considered to reflect the products of the institution for this study.

### Environmental Variables

These variables were defined in Chapter 2 and so





will only be listed.

Number of Financial Inputs.

Option in Selection of Students.

Manpower.

Stability of the Environment.

Community Support.

### Reliability

The internal consistency of the six structural scales Specialization, Documents, Recording of Role Performance, Autonomy, Centralization and Standardization and for the contextual scale Community Support was ascertained in the scaling and item analysis procedures described later in this chapter. The mean item analysis values for the seven scales ranged from 0.652 to 0.854.

### Validity

The validity of the data was assessed by showing the data for each group of institutions to the superordinate responsible for that group of institutions and asking him if the data appeared to be correct, at least



on an intuitive basis.<sup>1</sup> Three of these assessors agreed that the data appeared to be accurate and the fourth indicated that the data did not appear to contain any gross error.

#### DATA

The officials at the provincial government level who were responsible for coordinating the various groups of institutions were advised of the proposed study and their support was requested and received. The president/principal of each of the twenty-three institutions in the study was contacted and asked to cooperate in the study; all agreed to cooperate.

The data were collected in an interview with the president/principal of each institution except two. In two institutions (Camrose and Trinity) the president was not available and the data were gathered in an interview with the dean of the college. Interviews ranged in length from forty-five minutes in one of the new small colleges to two hours and thirty minutes. The data were recorded on the interview schedule during the interviews which

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<sup>1</sup>The four assessors were: Mr. A.E. Soles, Superintendent, Post-Secondary Services, British Columbia Department of Education; Dr. H. Kolesar, Chairman, Alberta Colleges Commission; Mr. J.P. Mitchell, Director of Vocational Education (Alberta); Mr. J.E. Hawker, Director, Agricultural and Vocational Colleges (Alberta).



were also taped. All available documents such as calendars, manuals, booklets and administrative forms were requested for subsequent verification of the data noted during the interview. Later all tapes were played to further verify the data. Because of inconsistencies in some data, clarification was sought in two instances by sending letters and in two others through telephone calls.

### DATA SOURCES

The data were gathered from all public and selected private one-year and two-year post-secondary educational institutions, exclusive of vocational schools, in Alberta and in British Columbia. The twenty-three institutions consisted of public and private colleges, agricultural colleges and institutes of technology. Three of the private colleges were owned and operated by religious groups. The fourth, Columbia Junior College, was privately owned. Only those private colleges whose primary offerings were university equivalent programs were selected. The specific institutions were as follows.

#### Colleges

##### Alberta.

1. Grande Prairie College
2. Lethbridge Community College
3. Medicine Hat College
4. Mount Royal College (Calgary)



5. Red Deer College
6. Camrose Lutheran College (private)
7. College St. Jean (Edmonton) (private)

British Columbia.

1. Capilano College (West Vancouver)
2. Cariboo College (Kamloops)
3. The College of New Caledonia (Prince George)
4. Douglas College (New Westminster)
5. Malaspina College (Nanaimo)
6. Okanagan Regional College (Kelowna)
7. Selkirk College (Castlegar)
8. Vancouver City College, Langara
9. Columbia Junior College (Vancouver) (private)
10. Trinity Junior College (Langley) (private)

Institutes of Technology

Alberta.

1. Northern Alberta Institute of Technology  
(Edmonton)
2. Southern Alberta Institute of Technology  
(Calgary)

British Columbia.

1. British Columbia Institute of Technology  
(Burnaby)





## Agricultural and Vocational Colleges

### Alberta.

1. Fairview College
2. Olds College
3. Vermilion College

## DATA ANALYSES

Levy and Pugh (1970) have discussed the techniques, rationale and implications of the methodology developed in the Aston studies. All analyses were done with the aid of a computer using existing programs or programs modified or developed for this study.

### Scaling and Item Analysis

The Aston researchers developed several series of items to measure the various dimensions of structure. Each of these series of items was subjected to scalogram analysis to discover whether the items formed a scale in the Guttman sense. A decision was made to repeat this analysis in this study for the following reasons. First, some items in the Aston scales were altered to make them applicable to educational institutions. The second reason was that the institutions in this study served very similar functions. Finally, the institutions in this study were small compared to those in the Aston study.



One problem in scaling is to determine whether the items in a scale are measuring on a single continuum; that is, to determine whether a set of items is unidimensional. The procedure used in scaling was scalogram analysis which was originally developed by Guttman (1950).

Guttman (1950:62) explained the concept of a scale as follows.

We shall call a set of items of common content a [Guttman] scale if a person with a higher rank (or score) than another person is just as high or higher on every item than the other person.

A scalogram can be used to see whether a set of items form a Guttman scale. A scalogram consists of an array with the horizontal axis formed by the items in descending order of endorsement and the vertical axis formed by the institutions in descending order of scores on the scale. If a set of items formed a perfect Guttman scale, the array would be a triangle having neither "holes" nor endorsements outside it.

The scalogram analysis is simplest if all items are binary. In the Aston studies some scales were entirely binary response items such as Specialization and Autonomy. Other scales such as Centralization and Standardization in Procedures for Selection and Advancement had multiple response categories. The approach taken with the multiple response items in constructing the scalogram was to score each item cumulatively. For example, if an item had four possible responses, and the institution selected the third



response, then responses one, two and three would all be scored. This method was taken from Coombs (1964:229-236) who discussed multicategory items in detail.

Once the scalograms have been constructed the problem is to determine how closely the actual scalogram approximates a perfect scalogram.

Several possible indices have been used by researchers to determine the goodness of fit of data to the Guttman model. The Aston group (Levy and Pugh, 1969:197) rejected the coefficient of reproducibility which is based upon a count of the discrepancies from the perfect binary pattern. The reason for this rejection, as stated by Levy and Pugh (1969:197), is that in using a coefficient of reproducibility, they would be ". . . attempting to reproduce the pattern in terms of the observed and fallible marginal totals rather than in terms of the latent continua." A second reason for the rejection is that the coefficient of reproducibility fails to take account of the severity of departures from the pattern.

The coefficient used in the Aston studies and in this study to determine goodness of fit is one developed by Brogden (1949) which, according to Levy and Pugh (1969:199), ". . . retains all the properties of the biserial coefficient but which frees it from the bivariate normality assumption."



Levy and Pugh (1969:200) observed that the Brogden coefficient and the biserial coefficient are related in that the latter is a special case of the Brogden coefficient. That is, when the observed score distribution is normal, the biserial coefficient and the Brogden coefficient are identical.

Lord and Novick (1968:340) indicated that the Brogden coefficient may only be used when the correlation between the continuous and dichotomous variables is positive. When necessary, a positive correlation can be achieved by reversing the scoring on the dichotomous variable.

Levy and Pugh describe the logic of the Brogden coefficient using the Specialization scale as an example (Levy and Pugh, 1969:199).

First, if a specialism discriminates well between the high and low scoring organizations, then the mean score ( $m_1$ ) of those which endorse the specialism will be larger than the mean score ( $m_0$ ) of those that do not. The difference between these two means,  $m_1 - m_0$ , is the numerator of  $r$  where

$$r = \frac{m_1 - m_0}{M_1 - M_0}$$

The denominator is the maximum value of the same mean difference given the observed score distribution and assuming that the specialism were a perfect discriminator.





In the present study scalograms were constructed for seven scales: Specialization, Documents, Recording of Role Performance, Standardization of Procedures for Selection and Advancement, Centralization, Autonomy and Community Support. The scalograms are in Appendix B. Brogden coefficients were calculated for each item. Items with low coefficients were dropped, the scales were re-scored and the calculations were repeated. The question arose of how long to continue this process of dropping items. Coombs (1964) provided guidance in answering this question. He distinguished between a scaling criterion and a scaling method. He stated (Coombs, 1964:81):

On the one hand the technique [scalogram analysis] may be used to test the hypothesis that a unidimensional latent attribute can account for the observed behavior, in which case it is a scaling criterion. On the other hand it may be used to construct a unidimensional scale, in which case it is a scaling method.

In this study scalogram analysis was used as a scaling method. A decision was made to reject any item having a Brogden coefficient less than .40. This decision was based on Sach's (1964:335) statement that in test construction, a mean biserial coefficient of 0.40 is considered adequate. If a mean coefficient of 0.40 is adequate, then a minimum item value of 0.40 was considered acceptable.

Table 1 is a summary of the results of the item analysis. As mentioned earlier, the multicategory items present some inconvenience in the type of analysis under-



Table 1  
Summary of Item Analysis Results

	No. Items at start	No. Items deleted $r < .40$	No. Items not used for $r$	No. Items used for $r$	Mean $r$	No. Items remaining $r < .40$	Mean $r$ Aston
Specialization	13	2	1	10	.717	1	.76
Documents	15	3	1	11	.652	0	.74
Record. Role Performance	10	2	0	8	.770	0	.67
Standardization	44	22	7	15	.854	0	.62
Autonomy	18	0	3	15	.788	0	.74
Centralization	108	30	41	37	.784	1	.40
Community Support	9	2	0	7	.696	0	N/A



taken. If an item had more than two possible responses, then each possible response was considered as an "item" in Table 1. For example, the Centralization scale was a list of eighteen decisions each with a choice of six responses. The total number of "items" for this scale was 108. In multicategory items, if one category had a very low coefficient, the entire multicategory item was dropped.

The items not used for calculating the mean item analysis value for a scale fall into two groups. The first group includes items to which all institutions responded positively or to which no institution responded positively. Such items would receive a Brogden coefficient of one. Since such items do not discriminate, they were ignored for further analysis although they were used for description.

The second group of items not used in calculating mean item analysis values was found in multicategory items. Since the multicategory items were scored cumulatively, the lowest category on which an institution scored was also endorsed by all institutions and therefore did not discriminate. Categories below the lowest category to receive an endorsement were, because of the cumulative scoring, all endorsed by all institutions. Finally, if an item had no endorsements but was bracketed by two items each of which had endorsements, then that



item had the same endorsements as the succeeding category and had the same Brogden coefficient. In each of these three situations the items were not used in calculating the mean item analysis value for the scale.

The mean item analysis values for the scales ranged from .652 to .854 which appeared to be acceptable in view of Sach's statement given earlier. Also, these means exceeded the means achieved on the Aston studies for four of the six structural scales. The remaining two structural scales, Specialization and Documents, appeared to be acceptable although their means were not as high as those of the Aston studies.

#### Further Analyses

Once the scales were established in the process just described, the remaining analyses were performed.

Structure. The responses for each institution for each scale were scored to render scale scores on each of the six structural scales. The composite score Formalization was formed by adding the Documents and Recording of Role Performance scores. Scores on the Configuration items were also entered. Ranges, means and standard deviations were calculated for each scale. Normalized standard scores with a mean of fifty and a standard deviation of fifteen were calculated so that the scores on different scales would be directly comparable. Profiles for each institution in terms of the structural





variables were formed. Intercorrelation coefficients for the structural scale scores were calculated to determine the relationships between the structural variables. The structural scale scores were subjected to factor analysis to determine whether the underlying structural dimensions discovered by Pugh and his colleagues were present in the institutions in this study. Factor scores for each institution were derived, normalized and standardized. Structural profiles for each institution in terms of the structural dimensions (factors) were constructed.

Context. Only one set of items in the contextual material formed a scale. This was the Community Support Scale. All other contextual items were treated as individual items. Intercorrelation coefficients among the contextual variables were calculated to determine what relationships existed among them.

Relationships between context and structure. Scores on the contextual variables were correlated with the structural variable scores to determine what relationships existed among these two sets of variables. Scores on the contextual variables were also correlated with the structural factor scores to determine what relationships existed among the contextual variables and the structural factors.



### Correlation Coefficients

The relationships or associations between the variables in the study were indicated through the use of three different coefficients. When the variables were both continuous, the Pearson product-moment correlation coefficient was used. When continuous variables were correlated with dichotomous variables, the Brogden coefficient was used rather than the biserial or point biserial coefficients for the reasons stated in the discussion of scaling. When the dichotomous variables were intercorrelated, the phi coefficient was used (Ferguson, 1956:236-239).

Only coefficients that were greater than or equal to .404 were discussed since that is the required Pearson product-moment correlation coefficient for significance at the .05 level with 22 degrees of freedom. The number of degrees of freedom arises from the fact that there were 23 institutions in the study.



## Chapter 5

### ORGANIZATIONAL STRUCTURE

Twelve structural variables were examined in this study. They were Specialization, Formalization, Documents, Recording of Role Performance, Standardization, Centralization, Autonomy, Chief Executive Span, Subordinate Ratio, Percentage of Clerks, Percentage of Non-workflow Personnel and Percentage of Superordinates. This chapter reports the findings with respect to the structural variables.

This chapter begins with a brief discussion of the means and standard deviations of the structure scores. Following this, a structural profile is shown for each institution. Next, the intercorrelations of the structural variables are reported. The results of the factor analysis are then reported and profiles for each institution in terms of factor scores are shown.

### STRUCTURAL VARIABLES

The structural variables, Specialization, Documents, Recording of Role Performance, Standardization, Centralization and Autonomy were each measured using a scale. Scores on the variables, Chief Executive Span, Subordinate Ratio, Percentage of Clerks, Percentage of Non-workflow Personnel and Percentage of Superordinates, were calculated



and were based on counts of positions in the institutions. Appendix C shows the scores of each institution on each structural variable. Also, the endorsements of each institution on the Centralization Scale are shown. The endorsements of each institution on each item on the remaining scales are shown in Appendix B.

Table 2 shows the means, standard deviations and ranges for each structural variable. Variations among the institutions existed for each variable as is indicated by the ranges and standard deviations.

Table 2

Means, Standard Deviations and Ranges  
for Structural Variables (n = 23)

Variable	Total Items	Mean	Standard Deviation	Range
Specialization	11	5.35	2.10	3 - 10
Documents	12	8.43	2.71	3 - 12
Record.RolePerf.	8	4.96	2.25	0 - 8
Formalization	20	13.39	4.28	3 - 19
Standardization	22	12.26	3.45	6 - 20
Centralization	78	62.04	9.04	49 - 78
Autonomy	18	9.13	3.92	3 - 17
Chief Exec. Span	-	9.70	9.52	2 - 36
Subordinate Ratio	-	11.57	15.26	3 - 33
% Clerks	-	15.26	5.93	7 - 31
% Non-workflow	-	32.22	11.86	14 - 56
% Superordinates	-	6.09	2.37	2 - 10





## STRUCTURAL PROFILES

The organizational structures of institutions can be concisely illustrated by profiles based on standardized scores. The structural scores for each institution were normalized and standardized to a mean of fifty and a standard deviation of fifteen. Table 3 shows the standardized scores for each institution for each structural variable.

Using the data in Table 3, the structural profiles in Figure 1 were constructed. Formalization scores, which were formed by adding the Documents and Recording of Role Performance scores, were shown but the latter two variables were not shown. Similarly, Autonomy is shown but Centralization was omitted since the two variables were closely related.

Of the five Configuration measures, only two were included in the profiles. Percentage of Non-workflow Personnel was included since it appeared to be independent of the other four Configuration variables. Conversely, Percentage of Superordinates was included since it had the strongest relationships with each of Chief Executive Span, Subordinate Ratio and Percentage of Clerks ( $r = -.586$ ,  $r = -.493$  and  $r = .470$  respectively).

The profiles show that differences existed in the organizational structures of the institutions in the study. These differences are discussed during the discussion of the analyses in Chapter 7.



Table 3

Normalized Standard Scores on Structural  
Variables for the Sample

	Chief Ex. Span	Subord. Ratio	% Clerks	Specialization	Documents	Record. Role Perf.	Standardization	Autonomy	Centralization	Formalization	% Non-workflow	% Superordinate
Capilano	53	60	48	56	52	54	38	38	58	51	24	49
Cariboo	38	48	56	50	52	50	60	59	42	51	36	65
New Caledonia	80	80	63	32	24	50	44	63	42	32	36	20
Douglas	53	36	56	69	39	50	51	53	42	47	44	76
Malaspina	53	60	56	43	45	38	38	59	51	42	36	49
Okanagan	53	48	56	43	39	38	69	53	42	37	50	56
Selkirk	38	36	30	56	58	45	44	38	51	51	44	65
VCC, Langara	38	70	40	50	73	54	60	47	51	64	24	32
Columbia	73	36	40	43	32	45	30	80	27	32	44	32
Trinity	38	36	40	56	52	30	30	73	27	42	80	39
B.C.I.T.	53	48	40	56	39	45	80	38	62	42	36	49
Grand Prairie	53	36	67	32	63	61	60	59	36	64	56	76
Lethbridge	62	48	48	50	45	73	60	38	58	57	64	39
Medicine Hat	38	36	80	63	45	38	51	47	51	42	56	65
Mount Royal	38	60	56	76	52	61	60	53	51	57	56	44
Red Deer	38	54	67	76	73	30	51	50	51	51	50	56
Camrose	38	65	48	32	35	38	30	67	27	32	50	61
St. Jean	53	36	30	32	24	20	30	67	36	20	56	44
N.A.I.T.	38	54	56	63	63	73	44	38	70	76	44	56
S.A.I.T.	38	48	73	63	73	61	73	47	62	76	61	56
Fairview	65	60	30	43	52	61	60	24	80	57	70	39
Olds	62	36	48	43	63	61	51	38	65	64	64	49
Vermilion	69	70	30	32	58	73	44	24	70	64	70	32



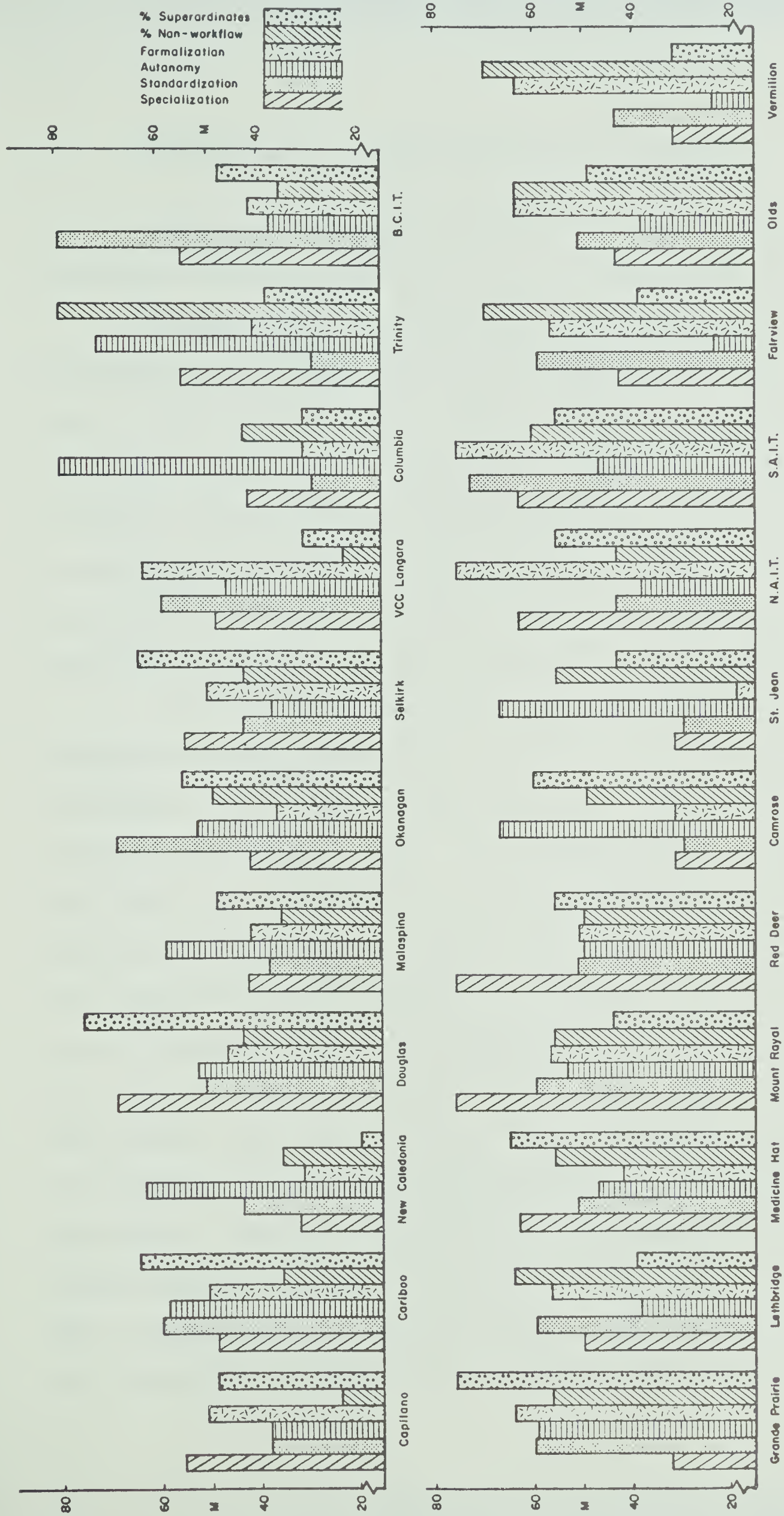


Figure 1  
Structural Profiles with Six Structural Variables





## RELATIONSHIPS BETWEEN STRUCTURAL VARIABLES

The intercorrelations which were calculated between the twelve variables of structure are shown in Table 4.

As was expected, Documents and Recording of Role Performance correlated highly with Formalization ( $r = .851$  and  $r = .797$  respectively). These correlations were expected since the Formalization scores were formed by summing the Documents and Recording of Role Performance scores. The Autonomy and Centralization variables were highly negatively correlated ( $r = -.846$ ). This relationship was expected since the same decisions were used to measure both variables.

Centralization had relatively strong positive relationships with Documents ( $r = .485$ ), Recording of Role Performance ( $r = .604$ ), Formalization ( $r = .624$ ), and Standardization ( $r = .520$ ). The relationships indicated that the higher the locus of decision making in the hierarchy in the institutions in this study, the greater were the tendencies to use documents to specify role behaviors and to check on adherence to specified role behaviors. Further, the more centralized the decision making in an institution, the greater was the tendency to institute standardized procedures for selection and advancement of employees. The correlation between Standardization and Formalization indicated a positive relationship ( $r = .490$ ). Thus, standardization of procedures relating to selection and advancement appeared to be related to the use of documents.





Table 4

Product-moment Correlations Between Variables of Structure (n = 23)

Variable	Specialization	Formalization	Documents	Recording Role Performance	Standardization	Autonomy	Centralization	Chief Executive Span	Subordinate Ratio	% Clerks	% Non-workflow	% Superordinates
Specialization	—											
Formalization	.265	—										
Documents	.401	.851	—									
Record. Role Perf.	.022	.797	.467	—								
Standardization	.281	.490	.424	.422	—							
Autonomy	-.201	-.650	-.570	-.552	-.564	—						
Centralization	.137	.624	.485	.604	.520	-.846	—					
Chief Exec. Span	-.447	-.212	-.460	.150	-.172	.108	.052	—				
Subordinate Ratio	-.277	.031	-.122	.207	.009	-.107	.092	.388	—			
% Clerks	.397	.181	.252	.040	.345	-.025	-.060	-.278	-.101	—		
% Non-workflow	-.068	.206	.177	.180	-.050	-.159	.283	.147	-.182	-.108	—	
% Superordinates	.264	.082	.230	-.122	.188	-.025	-.122	-.586	-.493	.470	-.190	—



An interrelationship apparently existed between the structural variables concerned with centralized decision making, the general use of documents and standardization of procedures. Similar variables have been found to interrelate in other studies on bureaucracy. The fact that the variable, Specialization, did not relate to any of the other bureaucratic variables was unexpected.

The relationships between the six variables, Chief Executive Span, Subordinate Ratio, Percentage of Clerks, Percentage of Non-workflow Personnel, Percentage of Superordinates and Specialization were generally weaker than the relationships between the variables discussed earlier. Percentage of Superordinates had negative relationships with Chief Executive Span ( $r = -.586$ ) and Subordinate Ratio ( $r = -.493$ ), but a positive relationship with Percentage of Clerks ( $r = .470$ ). The data suggested that the more superordinates there were in an institution in this study, the taller was the hierarchy and the narrower the span of control of the chief executive. The data further indicated that the more superordinates there were in an organization the fewer subordinates reported to each of them. Finally, the more superordinates there were in an organization, the greater was the number of clerical employees to provide various services.

Chief Executive Span was negatively related to Specialization ( $r = -.447$ ) and to Documents ( $r = -.460$ ).



The data suggested that the degree of specialization of support functions increased with a decrease in the span of control of the chief executive. This relationship probably was caused by a secondary linkage through size. As will be more fully reported later, Specialization was positively related to Size and Chief Executive Span was negatively related to Size. The relationship between Chief Executive Span and Documents could be explained in the same way.

With the exception of the instance discussed, Specialization did not relate to an appreciable degree to any of the other structural variables. Percentage of Non-workflow Personnel did not have a relationship with any of the other eleven structural variables that reached  $r = .300$ .

The above relationships suggested that some underlying dimensions of structure might be revealed by factor analysis. Factor analysis was carried out on the data to determine what underlying factors of structure were present.

#### FACTOR ANALYSIS OF STRUCTURAL VARIABLES

The twelve structural variables were subjected to principal component analysis as described by Harman (1960). Varimax rotation was used and five, four, three, and two-factor solutions were obtained. The two-factor solution appeared to be the most logical, except that the variable



Percentage of Non-workflow Personnel did not load on either factor. It had loadings of 0.285 and -0.208, and a communality of 0.125. This variable was dropped and factor analysis was carried out again on the remaining eleven variables.

The factor analysis data in Table 5 indicated that each of the eleven structural variables loaded on one or other of two dimensions of structure. The variables Formalization, Standardization, Centralization, Autonomy, Documents and Recording of Role Performance all loaded on the first factor. These variables all tended to control the behavior of participants so that predictability could be increased. Such control comes through written role specifications and records of performance, standardization in procedures for selection and advancement and concentrating authority near the top of the hierarchy. This factor or dimension was referred to as the Behavior Control dimension.

The variables Chief Executive Span, Subordinate Ratio, Percentage of Clerks, Percentage of Superordinates and Specialization all loaded on the second factor. The underlying dimension appeared to be concerned with the shape of the role structure. However, close examination of the variables revealed that this factor also indirectly reflected the degree of differentiation of function in the institution. Factor II was referred to as Role Structure.





Table 5  
Factor Analysis of Eleven Structural Variables

Variable	Communalities	Factor I Behavior Control	Factor II Role Structure
Formalization	.857	.911	.167
Documents	.754	.753	.431
Rec. Role Perf.	.725	.827	-.203
Standardization	.522	.676	.255
Autonomy	.771	-.878	-.009
Centralization	.775	.869	-.140
% Superordinates	.679	-.044	.823
Chief Ex. Span	.673	-.076	-.817
Subordinate Ratio	.437	.170	-.639
% Clerks	.391	.122	.613
Specialization	.470	.248	.639
Eigen Values	7.052	4.176	2.876
Percent of Common Variance			
	100.00	59.22	40.78
Percent of Total Variance			
	64.11	37.97	26.15

The negative loading of Chief Executive Span indicated that in an institution high on Factor II, the chief executive had a small span and thus, he tended to have a small number of administrators directly below him.



This fact gave the role structure height and indicated that the president was performing more highly specified functions than he would if the administrators below him were not there. Similarly, the Percentage of Superordinates reflected the number of administrators including department chairmen. The higher the percentage was, the more levels of administrators and the taller the organization. Also, the existence of several administrators indicated differentiation of task. The Subordinate Ratio reflected the average number of instructors reporting to the next level position such as department chairman. This variable loaded negatively on Factor II. A small Subordinate Ratio meant few instructors reported to each department chairman and therefore indicated a high role structure. This variable also reflected differentiation as a small ratio indicated several department chairmen which indicated high subject specialization.

The variable, Percentage of Clerks, was positively loaded on Factor II (.613). It can be argued that this variable indicated to some extent the width of the role structure at a particular point. Also, this variable was an indication of the degree of role differentiation. A high Percentage of Clerks may indicate that some of the routine tasks were removed from the faculty and professional library staff.



The variable Specialization was a measure of the degree to which selected support functions had been specialized or localized into roles. This variable gave an indication of the degree of differentiation in the support functions in the organization.

To summarize, the variables in Factor II gave an indication of the shape, in a topological sense, of the role structure of an organization. However, the variables also seemed to indicate the basis for the shape; that is, the degree of differentiation of function.

#### COMPARISON OF ASTON FACTORS AND FACTORS IN THIS STUDY

The structural factors found in this study differed from the factors found in the original Aston study. Table 6 shows the factor loadings of the variables in the original Aston study.

In both studies Autonomy, Centralization and Standardization of Procedures for Selection and Advancement loaded above zero on one factor; Behavior Control in this study and Concentration of Authority in the Aston study. Also, Chief Executive Span and Specialization loaded on one factor; Role Structure in this study and Structuring of Activities in the Aston study. In this study, Subordinate Ratio, Percentage of Clerks and Percentage of Superordinates loaded ( $-.639$ ,  $.613$  and  $.823$  respectively) on the factor, Role Structure. In the Aston



Table 6

Aston Factor Analysis of Nine Structural Variables<sup>a</sup>

Variable	Factors and Factor Loadings			
	I	II	III	IV
	Structuring of Activities	Concentration of Authority	Line Control of Workflow	Relative Size of Supportive Component
Specialization	.87	-.33	.01	-.13
Formalization	.87	.14	-.21	.17
Chief Ex. Span	.42	.23	-.07	-.03
% Superordinates	-.23	.60	[.50]	-.22
Autonomy	.10	-.92	.00	-.13
Centralization	-.33	.83	.01	.21
Standardization	.40	.59	[.50]	.09
Subordinate Ratio	-.05	-.19	[-.80]	-.06
% Clerks	.40	-.09	[.42]	[.67]
Percent of Total Variance				
	33.06	18.47	12.96	8.20

<sup>a</sup>Pugh et. al., 1968b:85.





study, both Percentage of Clerks and Percentage of Superordinates had secondary loadings (.42 and .50 respectively) on the same factor, Line Control of Workflow, as Subordinate Ratio (-.80).

Two differences in the loadings occurred between the two studies. Formalization loaded (.911) on the factor, Behavior Control, with Autonomy (-.878) and Centralization (.869) in this study. In the Aston study, Formalization loaded (.87) on the same factor as Specialization (.87) and Chief Executive Span (.42). The second difference was the loading of Percentage of Superordinates (.823) on the same factor as Specialization (.639) and Chief Executive Span (-.817) in this study rather than on the factor with Autonomy and Centralization as occurred in the Aston study.

Differences in the relationships between the structural variables were found in the two studies. Centralization and Formalization were strongly positively related ( $r = .624$ ) in this study. These two variables were not strongly related in the Aston study ( $r = -.20$ ) (Pugh et. al., 1968b:83). In this study, Percentage of Superordinates was strongly negatively associated with Chief Executive Span ( $r = -.586$ ), but was not associated to an appreciable extent, with Autonomy, Centralization or Standardization. In the Aston study Percentage of Superordinates was associated with the latter three variables ( $r \geq .39$ ), but was not related to an appreciable



extent to Chief Executive Span ( $r = .12$ ). The variations in the results of factor analysis in the two studies indicated that differences appeared to exist between the structures of the groups of organizations in the two studies. These differences were in associations between variables. That is, certain relationships among variables that were found in the industrial organizations were not found in the colleges. Conversely, the colleges had relationships among variables that were not found in the industrial organizations.

#### STRUCTURAL PROFILES USING FACTOR SCORES

Factor analysis revealed that eleven structural variables clustered to form two underlying dimensions of structure. A decision was made to calculate factor scores for each institution, and to then construct a structural profile for each institution in terms of these factor scores. Normalized and standardized factor scores were calculated; for each set of factor scores the mean was fifty and the standard deviation was fifteen.

Table 7 shows the two factor scores (rounded to the nearest whole number) for each institution. The scores for Factor I, Behavior Control, ranged from a high of sixty-six at Vermilion to a low of twenty-six at College St. Jean. In the array of scores for Factor I, only four scores were beyond one standard deviation from the mean.



A high score on Factor I indicated that behavior of participants tended to be highly controlled through the use of documents for role specification and checking, through standardized procedures for selection and advancement, and that the authority to make decisions tended to be centralized at the top of the hierarchy. A low Factor I scores indicated the reverse situation to that just described.

The scores for Factor II, Role Structure, ranged from a high of eighty at Medicine Hat to a low of three at the College of New Caledonia. Ten of the scores for Factor II were more than one standard deviation from the mean indicating that the Factor II scores were more widely spread than the Factor I scores. A high score on Factor II indicated that the institution probably had a relatively tall role structure and a relatively high degree of task differentiation.

The structural profiles for each institution in terms of factor scores are shown in Figure 2. These profiles illustrate the data in Table 7.

## SUMMARY

Differences were found among the institutions on all twelve structural variables; however, the variables clustered into three groups. The first group consisted



Table 7  
Structural Factor Scores

Institution	Factor I Behavior Control	Factor II Role Structure
Capilano	54	48
Cariboo	47	66
New Caledonia	43	3
Douglas	46	72
Malaspina	44	50
Okanagan	44	57
Selkirk	50	62
VCC, Langara	59	37
Columbia	32	24
Trinity	36	57
B.C.I.T.	55	51
Grande Prairie	51	69
Lethbridge	57	40
Medicine Hat	46	81
Mount Royal	55	61
Red Deer	51	77
Camrose	34	45
St. Jean	26	41
N.A.I.T.	64	60
S.A.I.T.	64	70
Fairview	63	22
Olds	62	46
Vermilion	66	11

of Formalization, Documents, Recording of Role Performance, Standardization, Autonomy and Centralization, which all intercorrelated at  $r = .422$  or higher. The second group of variables included Specialization, Chief Executive Span, Subordinate Ratio, Percentage of Clerks and Percentage of Superordinates. These variables did not all intercorrelate as highly as the variables in the first group. The twelfth variables, Percentage of Non-workflow





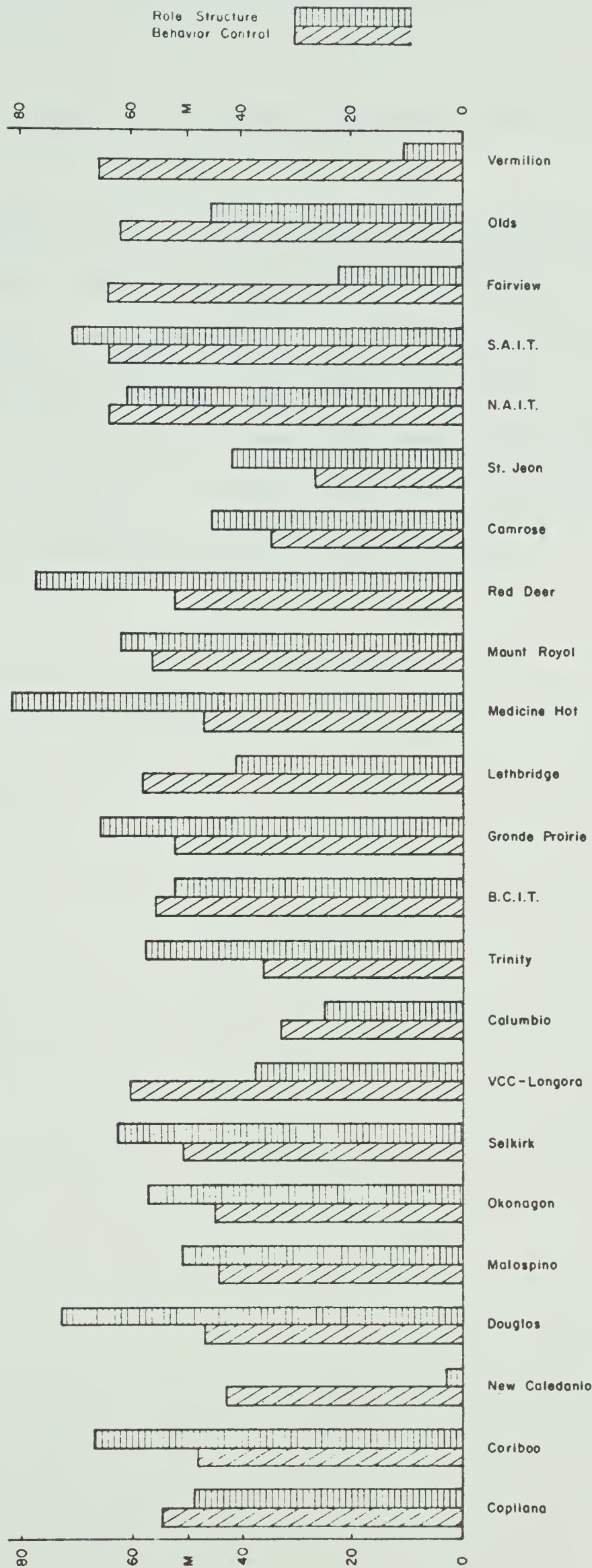


Figure 2  
Structural Profiles Based on Normalized Standardized Factor Scores



Personnel, was not strongly associated with any other variable.

Two factors, Behavior Control and Role Structure, were found. The variables loaded on the two factors in the groups indicated above. Percentage of Non-workflow Personnel was omitted from factor analysis. The structural factors found in this study differed from those found in the Aston studies. Greater variation in factor scores occurred for Factor II than for Factor I.



## Chapter 6

### THE CONTEXT OF ORGANIZATION STRUCTURE

The organizational structure of an institution is set in a context which includes variables characteristic of the individual institution and variables which form a part of the task environment of the institution. This chapter reports findings on the variables of context used in this study.

The contextual variables were measured using both dichotomous and continuous items. The presence of dichotomous items meant that relationships between variables could not all be indicated by Pearson product-moment correlation coefficients. Where the relationship was between two continuous variables, Pearson product-moment correlation coefficients were used. When the relationship was between a dichotomous and a continuous variable, the Brogden coefficient was used. Relationships between pairs of dichotomous variables were indicated by phi coefficients.

### CONTEXTUAL VARIABLES

The study included thirty contextual variables. Only the Community Support variable was measured by a scale. Table 8 shows the scores of each institution on each variable.



Table 8  
Scores on Contextual Variables

Institution	Founding	Age	Control Unit	Size-Admin, Instructors	Size-Employee	Size-FTE	No. Programs	Program Length	Flexibility	Variation Teach. Groups	Scheduling Block	Technical Innovations	Open Door	Select. Students (Int)	Select. Students (Wtest)	Location	Population	Dependence	No. Financial Inputs	Option Select. Students	Enrolment Change	Direction Enrol. Change	Supply of Instructors	Turnover	Educational Leave	Type of Institution	Community Support	Stud:Instructor Ratio	Stud:Admin:Instructor Ratio	Stud:Employee Ratio
Capilano	1	1	1	71	83	1045	4	0	1	1	1	2	1	2	0	0	3	2	3	0	2	2	1	1	1	1	1	19	149	13
Cariboo	1	0	1	37	46	600	3	0	1	2	1	0	1	2	0	0	3	1	3	0	0	0	1	1	0	1	3	21	120	13
New Caledonia	1	0	1	38	46	340	2	0	0	2	0	0	0	2	0	0	2	2	2	0	0	0	1	0	0	1	5	11	113	7
Douglas	1	0	1	77	96	1500	4	0	1	2	1	3	1	2	0	0	4	1	3	1	0	2	1	1	0	1	2	31	97	16
Malaspina	1	0	1	73	88	1111	4	0	1	3	1	1	1	2	0	0	2	3	0	0	2	2	1	1	1	1	5	19	148	13
Okanagan	0	1	1	46	61	778	1	0	1	3	1	1	0	2	0	0	3	0	3	0	0	0	1	1	0	1	5	24	111	13
Selkirk	0	2	1	79	104	833	3	0	1	3	0	3	1	1	2	0	2	1	3	0	2	2	1	1	1	1	5	16	76	8
VCC, Langara	1	2	1	233	267	4469	5	0	1	3	1	3	1	2	1	0	4	6	3	0	2	2	1	1	1	1	5	23	426	17
Columbia	1	9	2	33	40	470	0	0	0	2	1	0	1	2	1	0	4	1	1	0	1	0	1	1	0	2	2	19	134	12
Trinity	0	4	2	31	64	352	0	0	0	3	1	1	0	1	1	0	4	0	2	1	2	0	1	1	1	2	4	16	64	6
B.C.I.T.	1	3	4	360	445	2900	9	0	1	3	0	3	0	2	0	0	4	1	2	1	2	0	1	1	1	1	5	10	78	7
Grande Prairie	0	2	3	34	49	285	1	0	1	1	1	2	0	1	2	1	2	0	3	0	2	2	1	1	1	1	7	13	41	9
Lethbridge	0	6	3	67	112	994	7	0	1	3	1	2	1	1	1	3	1	1	1	0	2	1	1	1	1	1	5	19	117	9
Medicine Hat	0	2	3	33	48	429	2	0	1	2	1	1	2	0	1	1	1	1	2	0	2	1	1	0	1	1	5	18	66	9
Mount Royal	0	9	3	207	310	2350	7	0	1	3	1	3	1	2	2	1	4	0	2	0	2	2	1	1	1	1	3	15	90	8
Red Deer	0	3	3	82	116	850	2	0	1	3	0	2	1	1	1	1	3	1	2	0	2	2	1	1	1	1	7	14	71	7
Camrose	0	9	2	27	70	275	0	0	0	3	0	0	0	1	1	1	4	1	4	1	2	0	1	1	1	2	6	14	55	6
St. Jean	0	9	2	32	43	181	0	0	0	2	0	3	0	2	1	1	4	0	3	1	0	0	1	1	0	2	6	8	33	4
N.A.I.T.	1	4	4	488	639	3300	9	0	1	1	2	3	0	1	2	1	4	2	2	1	2	0	1	1	1	1	3	9	63	5
S.A.I.T.	0	9	4	382	594	2594	9	1	1	3	0	4	1	0	1	1	4	3	2	0	2	0	1	1	1	1	3	9	45	4
Fairview	0	9	4	19	38	143	2	1	1	0	2	0	1	1	1	1	4	1	2	0	0	0	0	0	1	4	3	10	41	4
Olds	0	9	4	46	77	346	4	0	1	1	1	1	1	1	1	1	4	2	2	0	2	1	1	1	1	4	3	9	53	5
Vermilion	0	9	4	25	54	178	5	0	1	2	1	1	1	2	2	1	4	2	2	0	0	1	1	1	1	4	3	8	70	3





Variation was found for each of the continuous variables. Only two of the dichotomous variables, Supply of Instructors and Program Length, were weak in that they separated only one or two of the institution from the others; these two variables were not used in the analyses.

#### INTERCORRELATIONS OF CONTEXTUAL VARIABLES

Correlation coefficients were calculated for each pair of contextual variables; the coefficients are shown in Tables 9, 10 and 11.

##### Continuous Variables

The Pearson product-moment correlation coefficients for the continuous variables are shown in Table 9. The Size measures correlated relatively strongly and positively with the variables Number of Programs and Technical Innovations ( $r = .794$  and  $r = .645$  respectively). Further, the two variables Number of Programs and Technical Innovations correlated relatively strongly and positively ( $r = .588$ ). These figures indicated that large institutions tended to offer more programs and that they had adopted more educational innovations than did smaller institutions.

The intercorrelations among the Size measures were interesting in that the correlation between Number of Administrators and Instructors and Number of Employees was very high ( $r = .947$ ) but the correlations between these two measures and enrolment were lower ( $r = .819$  and  $r = .779$



Table 9  
Product-Moment Correlations Between Continuous Variables of Context (n=23)

Variable	Age	Control Unit	Size-Admin, Instructors	Size-Employee	Size-FTE	No. Programs	Variation Teach. Groups	Scheduling Block	Technical Innovations	Select. Students (Int)	Select. Students (WTest)	Population	Dependence	No. Financial Inputs	Enrollment Change	Direction Enrol. Change	Type of Institution	Community Support	Stud:Instructor Ratio	Stud:Administrator Ratio	Stud:Employee Ratio
Age	—																				
Control Unit	.592	—																			
Size-Adm,Inst	.039	.380	—																		
Size-Employee	.110	.431	.947	—																	
Size-FTE	-.122	.085	.819	.779	—																
No.Progss	.051	.436	.785	.794	.698	—															
Var.Tch.Gps	-.106	-.271	.132	.141	.267	.113	—														
Sched.Bk	.003	.173	.030	.016	.073	.099	-.555	—													
Tech.Innov.	-.008	.160	.640	.645	.643	.588	.249	-.202	—												
Sel.St.(Int)	-.341	-.457	-.240	-.317	.001	-.156	.031	.074	-.194	—											
Sel.St.(WT)	.420	.433	.213	.251	.125	.197	-.070	.198	.212	-.463	—										
Population	.584	.314	.321	.334	.304	.234	-.027	.119	.191	.130	.194	—									
Dependence	-.122	-.092	.346	.312	.572	.368	.073	.051	.173	.016	-.018	.079	—								
No.Fin.Inpts.	-.375	-.566	-.251	-.282	-.084	-.206	.173	-.260	-.018	.081	-.244	-.257	.063	—							
Enrol.Ch.	-.198	.012	.308	.305	.302	.203	.364	-.204	.189	-.282	.137	-.313	.165	.057	—						
Dir.En.Ch.	-.206	-.118	-.088	-.103	.132	.082	.111	-.006	.247	.049	.317	-.389	.250	.116	.376	—					
TypeInstit.	.631	.713	.228	.260	-.029	.243	-.394	.203	-.068	.323	.266	.556	.074	-.464	-.272	-.383	—				
CommSupport	-.250	-.138	-.179	-.209	-.134	-.305	.279	.470	.050	-.082	-.068	-.454	-.105	.463	.399	.347	-.395	—			
St:InstRatio	-.546	-.671	-.237	-.277	.109	-.172	.256	.171	-.034	.389	-.357	-.173	.065	.303	-.044	.114	-.648	-.119	—		
St:AdmRatio	-.327	-.461	.108	.037	.543	.102	.243	.113	.088	.379	-.128	.030	.711	.187	.145	.327	-.353	.005	.485	—	
St:EmpRatio	-.593	-.704	-.101	-.168	.283	-.060	.220	.149	-.005	.527	-.427	-.165	.308	.277	.015	.206	-.624	-.112	.877	.692	—



respectively). This finding will receive further elaboration in the discussion of the staff and student ratios.

The variable Age was positively related to each of the variables Control Unit ( $r = .592$ ), Selection of Students (Written Tests) ( $r = .420$ ), Population ( $r = .584$ ) and Type of Institution ( $r = .631$ ). The oldest institutions in the study were the three agricultural colleges, three private colleges and S.A.I.T. The Age-Control Unit relationship was largely explained by the fact that four of these institutions were directly under a government department (high Control Unit score). Conversely, the youngest institutions were in British Columbia where the College Councils had strong local representation (low Control Unit score). This explanation of the Age-Control Unit relationship also applied to the Age-Type of Institution relationship. Since seven of the eight oldest institutions served diffuse populations (high Population score), the Age-Population relationship was easily explained.

The positive association between Age and Selection of Students (Written Tests) could not be explained from the data in Table 9. It might be suggested that the oldest institutions serve diffuse populations and therefore interviewing is not feasible; however, the correlation between the use of written tests in selection and Population was low although it was positive ( $r = .194$ ).

The variable Control Unit was related negatively to the use of interviewing in selecting students and was



related positively to the use of written tests ( $r = -.457$  and  $r = .433$  respectively). These findings could be explained by an examination of Table 8 which reveals that among the British Columbia public colleges (low Control Unit scores) all students were interviewed in seven of them and written tests were used in only two of them. Conversely, in the Alberta public colleges written tests were used in all but Medicine Hat. Further, all of the agricultural colleges, N.A.I.T. and S.A.I.T. (high Control Unit scores) used written tests.

The relationship between Type of Institution and Population ( $r = .556$ ) could be explained by the fact that the institutions in the three highest categories (private colleges, agricultural colleges and technological institutes) all served diffuse populations. The negative relationship between Type of Institution and Number of Financial Inputs ( $r = -.464$ ) was a reflection of the fact that the top two categories of types of institutions had the smallest number of sources of financial inputs.

The Community Support variable was related negatively to Scheduling Block and to Population and positively to Number of Financial Inputs ( $r = -.470$ ,  $r = -.454$  and  $r = .463$  respectively). The data did not suggest any explanation for the relationship between Community Support and Scheduling Block. The negative relationship between Community Support and Population indicated that institutions, mainly public colleges, in areas of less than 200,000 tended to have more





involvement with other institutions in their task environment and had more direct involvement with the community than did their counterparts in larger areas of those serving diffuse populations.

The public colleges generally had the largest number of sources of financial inputs. This fact helped to explain the relationship between Number of Financial Inputs and Community Support ( $r = .463$ ). Further support for the explanations given above was the negative correlation between Community Support and Type of Institution ( $r = -.395$ ) which indicated that public and private colleges tended to earn higher Community Support scores than technological institutes and agricultural colleges.

The negative relationships between Age and the Ratios of Students to Instructor and Students to Employee ( $r = -.546$  and  $r = -.593$  respectively) were largely explained by the fact that the oldest institutions offered technical programs or were private and residential. Each of these characteristics tended to lower these ratios.

The negative relationships between the three ratios, Students to Instructor, Students to Administrator and Students to Employee, and Control Unit ( $r = -.671$ ,  $r = -.461$  and  $r = -.704$ ) were partly explained in the discussion above. The agricultural colleges tended to have the lowest ratios but were directly under government departments which gave them a high Control Unit score. Conversely, the public colleges in British Columbia, which had low Control Unit



scores, had high ratios.

The only Size measure that was relatively strongly related to a ratio was Enrolment, which was related to Students to Employee Ratio ( $r = .543$ ). The indication was that this ratio and enrolment rose together.

The relationships between methods of selection of students, by interviewing or written test, and the Students to Employee Ratio were relatively strong ( $r = .527$  and  $r = -.427$  respectively). These relationships could partly be explained on a provincial basis. In British Columbia, where interviewing was commonly used, the ratios tended to be high. In Alberta, where written tests were commonly used, there were relatively low ratios. The relationship between Dependence and Students to Administrator Ratio ( $r = .711$ ) could also be explained on a provincial basis.

A negative relationship existed between Type of Institution and (1) the Students to Instructor Ratio and (2) the Students to Employee Ratio ( $r = -.648$  and  $r = -.624$  respectively). This finding indicated that public colleges tended to have high ratios and that technological institutes and agricultural colleges tended to have low ratios.

#### Continuous Variables and Dichotomous Variables

The relationships between the continuous variables and the dichotomous variables, as indicated by Brogden coefficients, are shown in Table 10. These values are all positive due to the nature of the Brogden coefficient



Table 10

Brogden Correlation Coefficients Between Dichotomous  
and Continuous Contextual Variables (n=23)

Variable	Age	Control Unit	Size-Admin, Instructors	Size-Employee	Size-FTE	No. Programs	Variation Teach. Groups	Scheduling Block	Technical Innovations	Select. Students (Int)	Select. Students (West)	Population	Dependence	No. Financial Inputs	Enrollment Change	Direction Enrol. Change	Type of Institution	Community Support	Stud:Instructor Ratio	Stud:Administrator Ratio	Stud:Employee Ratio
Founding	(-) .655	(-) .479	.426	.298	.546	.284	(-) .120	.242	(-) .023	.768	(-) .462	.042	.618	.057	(-) .104	(-) .148	(-) .327	(-) .345	.427	.836	.690
Flexibility	(-) .387	.425	.935	.952	.881	.941	.233	.489	.528	(-) .164	.274	(-) .425	.425	.115	.080	1.000	.032	(-) .156	.268	.332	.330
Open Door	.118	.012	(-) .174	(-) .133	.106	.300	.042	.240	.053	.034	.092	(-) .102	.631	.378	.477	.681	.038	(-) .568	.373	(-) .584	.449
Location	.748	.837	.150	.280	(-) .193	.176	(-) .303	.132	.131	.620	(-) .577	.161	.278	.201	.050	.071	.560	.164	.710	(-) .866	.841
OptionSelSt	.087	.068	.327	.289	.160	.014	.148	.148	.320	(-) .032	.193	1.000	.456	.225	.139	1.000	.203	.017	.116	.621	.266
Turnover	(-) .124	.068	.941	.968	.917	.584	.489	.042	.410	.477	.697	.357	.281	.028	.343	.681	(-) .090	(-) .203	.531	.601	.524
Educational Leave	.309	.760	.804	.878	.549	.593	.042	.148	.346	1.000	.798	.042	.456	.225	.508	1.000	.596	.288	.482	.036	.414





which was discussed in Chapter 4. The negative signs in Table 10 indicate the direction of the relationship according to the initial scoring.

Age was related negatively to Founding and positively to Location ( $r = .655$  and  $r = .748$  respectively). These relationships indicated that the older institutions were in Alberta and that their founders were no longer active in the institutions. The positive relationship between Control Unit and Location ( $r = .837$ ) indicated that Alberta had more institutions directly under government departments (five) than British Columbia (one). The fact that the institutions directly under government departments tended to be older than the other institutions helped to explain the relationship between Control Unit and Founding ( $r = .479$ ) which was negative. The relationship between Flexibility and Control Unit ( $r = .425$ ) was partly explained by the fact that only the four private colleges and one public college, all with low Control Unit scores, did not offer programs at the request of outside agencies. The relationship of Control Unit to Educational Leave ( $r = .760$ ) was explained by the fact that educational leave provisions existed in all institutions except four British Columbia public colleges and in two private colleges, all of these having low Control Unit scores.

The three measures of Size each had a relatively strong positive relationship to Flexibility ( $r \geq .881$ ), Turnover ( $r \geq .917$ ) and Educational Leave ( $r \geq .549$ ). These





relationships indicated that large institutions tended to offer programs at the request of outside agencies, had very low staff turnover and had educational leave provisions.

Number of Programs related very strongly with Flexibility ( $r = .941$ ). Reference to Tables 9 and 10 shows that both of these variables were positively related to Size which helped to explain their relationship. The positive relationships between Number of Programs and the variables Turnover and Educational Leave ( $r = .584$  and  $r = .593$  respectively) were largely explained by the relationship of each of these three variables with Size.

The positive relationship between Flexibility and Technical Innovations ( $r = .528$ ) could be explained by the high correlation of each with Size. The relationship between Turnover and Technical Innovations ( $r = .410$ ) could be explained in the same way.

The relationships between Selection of Students-Interviewing and Founding ( $r = .768$ ) and between Selection of Students-Interviewing and Location ( $r = .620$ ) which was negative, indicated that interviewing was commonly used in the British Columbia colleges and that their founders were still active in the institutions. The negative relationship between Selection of Students-Interviewing and Educational Leave ( $r = 1.000$ ) was explained by the fact that five of the six institutions without educational leave provisions were located in British Columbia.



Written tests seemed to be more favored in Alberta than interviewing for selection of students. The relationship between Selection of Students-Written Tests and each of Founding (negative,  $r = .462$ ), Location ( $r = .577$ ), Turnover ( $r = .697$ ) and Educational Leave ( $r = .798$ ) could be explained on a provincial basis.

The relationship between the variable Population and Option in Selecting Students ( $r = 1.000$ ) was a reflection of the fact that the institutions that exercise an option in selection all served diffuse populations.

The variable Dependence had relationships with Founding ( $r = .618$ ), Flexibility ( $r = .425$ ), Open Door ( $r = .631$ ) and Educational Leave ( $r = .456$ ). The variable Dependence was negatively related to Option in Selecting Students ( $r = .456$ ) indicating that the private colleges tended to not contract out functions. Those variables that were positively associated with Dependence tended to be associated with public institutions.

The strong relationship between Direction of Enrolment Change and Flexibility ( $r = 1.000$ ) was explained by the fact that those institutions that scored zero on the Flexibility scale offered only a restricted number of programs so that there can be little change in the proportions of enrolments in different programs. The relationships between Direction of Enrolment Change and Open Door ( $r = .681$ ) and Option in Selection of Students (negative,  $r = 1.000$ ) indicated that the private colleges generally



had not had shifts in enrolment proportions.

The relationships between Direction of Enrolment Change and Turnover ( $r = .681$ ) and Educational Leave ( $r = 1.000$ ) indicated that enrolment changes were taking place in the public colleges, particularly in Alberta.

The association between Type of Institution and Location ( $r = .560$ ) reflected that Alberta had more institutions operating under government departments than British Columbia had. The association between Type of Institution and Educational Leave ( $r = .596$ ) showed that the institutions directly under a government department tended to have such provisions and that some public colleges did not.

The only dichotomous variable that was related to Community Support was Open Door (negative,  $r = .568$ ). This relationship suggested that those institutions that did not have an open door admissions policy were more influenced by outside agencies and had more community involvement than the institutions that had open door admissions policies.

The three ratios, Students to Instructor, Students to Administrator and Students to Employee showed strong relationships to Location (negative,  $r = .710$ ,  $r = .866$  and  $r = .841$  respectively). These relationships indicated that the ratios were all lower in Alberta than in British Columbia. The fact that all three ratios had a positive relationship with Founding supported the provincial explanation.



### Dichotomous Variables

Phi coefficients were calculated to show the degree of relationship between the pairs of dichotomous variables. Table 11 shows these coefficients.

Table 11

Phi Coefficients for Dichotomous Contextual Variables

Variable	Founding	Flexibility	Open Door	Location	OptionSel. Students	Turnover	Ed. Leave
Founding	—						
Flexibility	-.009	—					
Open Door	.023	.478	—				
Location	-.630	.122	.030	—			
OptionSelSt.	.126	-.389	-.579	-.021	—		
Turnover	.127	.301	.140	-.173	.011	—	
Ed. Leave	-.320	.389	.181	.404	-.094	.239	—

Only three pairs of dichotomous variables had relatively strong relationships. Founding and Location were related ( $r = -.630$ ) which indicated that the founders are still active in the colleges in British Columbia. The negative relationship between Open Door and Option in Selection of Students ( $r = -.579$ ) was logical in that an institution would not have an open door admissions policy





if it exercised options in selecting students. Finally, the positive relationship between Open Door and Flexibility ( $r = .478$ ) indicated that institutions having an open door admissions policy put on programs at the request of outside agencies.

### SUMMARY

Differences were found among the institutions for all thirty contextual variables. Two variables, Control Unit and Size, were key variables around which other contextual variables clustered. The variables Location, Type of Institution, Age, Flexibility, Educational Leave and Number of Programs were all positively related to Control Unit. The variables Number of Financial Inputs and the ratios of Students to Instructor, Students to Administrator and Students to Employee were all negatively associated with Control Unit. The variables associated with Control Unit did not all interrelate although there were some smaller clusters such as the ratios, Type of Institution and Location. The lack of association between the variables relating to Control Unit indicated that these variables were independent.

The variables forming a cluster with Size were Number of Programs, Flexibility, Founding, Technical Innovations, Turnover and Educational Leave. Number of Programs formed the nucleus for a smaller cluster consisting of Technical Innovations, Flexibility, Turnover and



Educational Leave. However, the relationships between Number of Programs and these latter variables were weaker than their relationships with Size. With the exceptions mentioned, the variables related to Size were not strongly interrelated and therefore tended to vary independently.

No other clusters or patterns of related variables were found although each of the contextual variables was related to at least two others.



## Chapter 7

### RELATIONSHIPS OF STRUCTURE AND CONTEXT

This chapter reports the findings of this study concerning the relationships between structure and context. The interrelationships of variables of structure and variables of context will be reported first followed by the interrelationships of the structural dimensions or factors and the contextual variables.

#### RELATIONSHIPS BETWEEN STRUCTURAL VARIABLES AND CONTEXTUAL VARIABLES

##### Continuous Contextual Variables

The Pearson product-moment correlation coefficients between the structural variables and the continuous contextual variables are shown in Table 12.

The variable Specialization was positively associated with Size-Administrators and Instructors ( $r = .410$ ), Size-Employees ( $r = .429$ ) and Size-Enrolment ( $r = .418$ ). This finding suggested that the larger the institution, the higher the degree of specialization of support functions. The positive relationships of Specialization with Number of Programs ( $r = .400$ ) and Technical Innovations ( $r = .500$ ) were explained by the fact that these latter two variables were both strongly associated with the Size measures.



Table 12

Product-moment Correlations Between Structural Variables  
and Continuous Contextual Variables (n = 23)

Variable	Age	Control Unit	Size-Admin, Instructors	Size-Employee	Size-FTE	No. Programs	Variation Teach. Groups	Scheduling Block	Technical Innovations	Select. Students (Int)	Select. Students (WTest)	Population	Dependence	No. Financial Inputs	Enrollment Change	Direction Enrol. Change	Type of Institution	Community Support	Stud:Instructor Ratio	Stud:Administrator Ratio	Stud:Employee Ratio
Specialization	-.120	.131	.410	.429	.418	.400	.285	-.008	.500	-.110	.116	.057	-.063	-.316	.215	.246	-.234	-.147	.203	-.023	.133
Formalization	.071	.448	.394	.425	.394	.576	-.235	.422	.304	-.422	.568	.112	.374	-.208	.159	.382	.269	-.255	-.126	.133	-.101
Documents	-.044	.352	.355	.380	.382	.423	-.056	.272	.370	-.465	.489	.033	.348	-.198	.242	.483	.154	-.044	-.071	.140	-.062
Record. Role Perf.	.191	.429	.323	.351	.290	.588	-.381	.477	.133	-.244	.493	.173	.294	-.159	.011	.145	.327	-.433	-.154	.084	-.117
Standardization	-.206	.343	.448	.451	.439	.607	.065	.027	.328	-.087	-.031	-.052	.147	-.097	.161	.046	.090	-.024	-.003	.062	.038
Autonomy	-.258	-.468	-.312	-.314	-.285	-.589	.225	-.228	-.308	.176	-.220	-.010	-.332	.140	-.033	-.286	-.382	.129	.212	-.033	.162
Centralization	.258	.655	.450	.469	.282	.658	-.346	.312	.233	-.251	.253	.244	.280	-.354	-.085	.016	.665	-.349	-.447	-.144	-.371
Chief Exec. Span	.222	.054	-.331	-.326	-.391	-.228	-.296	.018	-.526	.212	-.024	.025	-.014	-.290	-.298	-.281	.282	-.262	-.224	-.071	-.172
Subordinate Ratio	-.051	-.160	-.011	-.037	.142	.049	.032	-.095	-.237	.229	-.012	.017	.516	.298	.054	.104	-.008	.123	-.127	.422	.034
% Clerks	-.312	.098	.160	.200	.073	.137	.078	-.057	.103	-.162	-.131	-.512	.003	-.045	.362	.132	-.335	.161	.124	-.139	.063
% Non-workflow	.568	.564	-.243	-.155	-.418	-.106	-.179	.226	-.170	-.430	.376	.243	-.361	.333	-.233	-.178	.529	-.151	-.403	-.517	-.604
% Superordinates	-.346	-.085	.031	.032	-.057	-.032	-.029	-.078	.212	-.186	-.038	-.328	-.284	.301	.042	.090	-.273	.168	.267	-.315	.126





The variable Formalization was positively associated with Control Unit ( $r = .448$ ). This finding indicated that institutions reporting directly to government departments tended to use much documentation. The relationship of Formalization and Size-Employees ( $r = .425$ ) supported the explanation given above since the three institutions which were largest in terms of employees were the technological institutes. The relationship of Formalization and Number of Programs ( $r = .576$ ) was largely explained in the same way in that the three technological institutes offered the largest number of programs.

The relationship between Formalization and Selection of Students-Written Tests ( $r = .568$ ) indicated that the use of documents in the institutions was not restricted to administrative matters but also involved the students. As indicated earlier, the two methods of selection of students were negatively related which explained the Selection of Students-Interviewing and Formalization relationship ( $r = -.422$ ).

The relationships between Documents and Number of Programs ( $r = .423$ ), Selection of Students-Interviewing ( $r = -.465$ ) and Selection of Students-Written Tests ( $r = .489$ ) could be explained in the same way as the Formalization relationships to these variables since Documents and Formalization were both concerned with the amount of documentation in the institution. The relationship of Documents and Direction of Enrolment Change ( $r = .483$ ) could



be explained by the fact that the private colleges did not report shifts in the proportion of enrolments in programs. These colleges had the lowest Documents Scale scores.

Recording of Role Performance was positively associated with Control Unit ( $r = .429$ ) indicating the use of documents for recording employee behavior tended to be high in institutions operating under a government department. This explanation applied also to the relationship between Recording of Role Performance and Number of Programs ( $r = .588$ ) since the three technological institutes had the greatest number of programs and were directly under the provincial governments.

The negative relationship between Recording of Role Performance and Community Support ( $r = -.433$ ) probably could be largely explained by the fact that the five provincial government institutions in Alberta had low Community Support scores and high Recording of Role Performance scores.

Standardization was positively associated with all three measures of Size ( $r \geq .439$ ). It appeared that larger institutions standardize procedures and that smaller ones tend to be more flexible in the matter of procedures. The variable Number of Programs was positively associated with Standardization ( $r = .607$ ). This finding was largely explained by the Size-Standardization relationship.

The Autonomy variable was negatively associated with Control Unit ( $r = -.468$ ). This finding reflected the



fact that the institutions operating under a government department had the lowest Autonomy scores and private colleges had the highest Autonomy scores. The Autonomy variable was negatively related to Number of Programs ( $r = -.589$ ). This finding was explained by the fact that the three technological institutes (all under government departments) had the widest program offerings while the private colleges, which had the highest Autonomy scores had generally narrow offerings.

The variable Centralization had a positive relationship with Control Unit ( $r = .655$ ). This finding was a result of the six institutions in the study that operate under a government department having the highest Centralization scores. The private colleges had the lowest Centralization scores. The relationship between Centralization and Type of Institution ( $r = .665$ ) supported this explanation.

The Centralization Scale scores were related to the Size measures Administrators and Instructors ( $r = .450$ ) and Employees ( $r = .469$ ) but not to the Size-Enrolment variable. The explanation for the relationship of Centralization to the first two size measures was that the three largest institutions in the study by these two measures were the institutes of technology, which had high Centralization scores. The lack of relationship between Centralization and Enrolment stemmed from the fact that the rankings of Size by Enrolments differed from rankings by the





other Size measures. The relationship of Autonomy and Number of Programs ( $r = -.589$ ) has been explained earlier by the Size relationship.

There was a negative relationship between Centralization and Students to Instructor Ratio ( $r = -.447$ ). This relationship was explained by the high Centralization scores of the institutions under government departments which tended to have low students to instructor ratios.

The Percentage of Non-workflow Personnel was associated with both Age ( $r = .568$ ) and Control Unit ( $r = .564$ ). Both of these relationships were explained by the fact that the Alberta institutions under government departments (high Age and high Control Unit scores) had the largest scores on Percentage of Non-workflow Personnel. This explanation was supported by the relationship between Type of Institution and Percentage of Non-workflow Personnel ( $r = .529$ ).

Percentage of Non-workflow Personnel was negatively associated with the Students to Employee Ratio ( $r = -.640$ ). This figure indicated that the lower the ratio of students to employees in an institution, the larger the proportion of these employees that were not involved in instruction or in educational administration.

The Percentage of Superordinates variable was not associated with any of the continuous contextual variables. Chief Executive Span was negatively related to Technical Innovations ( $r = -.526$ ). This finding could be explained





by the fact that wide spans were characteristic of small institutions and these institutions had few technical innovations.

The Subordinate Ratio was positively associated with the Students to Administrator Ratio ( $r = .422$ ). The administrative time of all department chairmen was counted in the number of administrators. Thus, a low Student to Administrator Ratio probably indicated the presence of several department chairmen which would give a low Subordinate Ratio.

The Percentage of Clerks variable did not appear to have any meaningful relationships with any of the continuous contextual variables. The only coefficient that was relatively high was that between Percentage of Clerks and Population ( $r = -.512$ ). However, this relationship did not seem to have a logical explanation.

#### Dichotomous Contextual Variables

The Brogden coefficients showing the relationships between the structural variables and the dichotomous contextual variables are shown in Table 13. All of the coefficients are positive although some of the relationships in terms of the original scoring were negative. This problem is due to the nature of the Brogden coefficient which was discussed in Chapter 3. The negative signs in parentheses indicate the relationships that were negative in direction.



Table 13  
Brogden Correlation Coefficients Between Structural Variables  
and Dichotomous Contextual Variables (n = 23)

Variable	Founding	Flexibility	Open Door	Location	Option in Sel. of Students	Turnover	Educational Leave
Specialization	(-) .008	.659	.493	.097	.054 (-)	.468	.389
Formalization	(-) .114	.967	.515	.380	.505 (-)	.586	.784
Documents	(-) .247	.901	.489	.327	.398 (-)	.573	.815
Record. Role Perf.	.068	.729	.389	.349	.462 (-)	.376	.462
Standardization	.024	.921 (-)	.141 (-)	.065 (-)	.311 (-)	.175 (-)	.238 (-)
Autonomy	.158 (-)	1.000	.499	.352	.359 (-)	.060	.680
Centralization	.080	.945 (-)	.408	.468 (-)	.213 (-)	.000 (-)	.689 (-)
Chief Exec. Span	.219	.452 (-)	.053 (-)	.168 (-)	.659 (-)	.396 (-)	.442
Subordinate Ratio	.308 (-)	.169	.051	.075	.406 (-)	.242 (-)	.084
% Clerks	.111 (-)	.520 (-)	.132	.306	.414 (-)	.074 (-)	.148
% Non-workflow	1.000 (-)	.067	.030 (-)	.718	.007 (-)	.216	.457
% Superordinates	.128	.546	.015	.089	.188	.326	.030



Specialization was associated with Flexibility ( $r = .659$ ), Open Door ( $r = .493$ ) and Turnover ( $r = .468$ ). These figures indicated that institutions that had a low degree of specialization of support functions, did not have an open door admissions policy, had a relatively high turnover in staff and did not offer programs at the request of outside agencies. New Caledonia and College St. Jean best exemplified this pattern.

Formalization was associated with each of Flexibility ( $r = .967$ ), Open Door ( $r = .515$ ), Turnover ( $r = .586$ ) and Educational Leave ( $r = .784$ ). Formalization was negatively associated with Option in Selection of Students ( $r = .505$ ). The relationship with the variables Flexibility, Open Door and Option in Selection of Students suggested that the institutions giving rise to these relationships may have been the private colleges. Reference to their scores confirmed that these institutions did tend to have low Formalization scores. Table 13 shows that the two subscales of Formalization, Documents and Recording of Role Performance, each had relationships with the dichotomous contextual variables similar to those of Formalization.

The Autonomy Scale scores were negatively related to Flexibility (negative,  $r = 1.000$ ), Open Door (negative,  $r = .499$ ) and Educational Leave (negative,  $r = .680$ ). These negative relationships indicated that institutions high on Autonomy did not put on programs at the request of



outside agencies, did not have open door admissions policies and did not have educational leave provisions. Again, the private colleges influenced these figures.

Centralization was positively associated with Flexibility ( $r = .945$ ), Open Door ( $r = .408$ ), Location ( $r = .468$ ) and Educational Leave ( $r = .689$ ). Thus, institutions with high Centralization scores did put on programs at the request of outside agencies, did have open door admission policies and had educational leave provisions.

The variable Chief Executive Span was negatively associated with Flexibility (negative,  $r = .452$ ), Option in Selection of Students (negative,  $r = .659$ ) and Educational Leave (negative,  $r = .442$ ). Thus, the wider the span, the greater was the tendency to not put on programs at the request of outside agencies, to not exercise options in selecting students and to not have educational leave provisions.

Percentage of Clerks and Percentage of Superordinates were both positively related to Flexibility ( $r = .520$  and  $r = .546$  respectively). Percentage of Non-workflow Personnel was strongly negatively associated with Founding (negative,  $r = 1.000$ ) and was positively associated with Location ( $r = .718$ ). Both of these relationships indicated that there tended to be higher percentages of non-workflow employees in the institutions in Alberta than in those in British Columbia.





RELATIONSHIPS BETWEEN STRUCTURAL DIMENSIONS  
AND CONTEXTUAL VARIABLES

The Pearson product-moment correlation coefficients showing the relationships between the continuous contextual variables and the structural dimensions are shown in Table 14. Also, the Brogden coefficients showing the relationships between the structural dimensions and the dichotomous contextual variables are shown in Table 15.

The Behavior Control dimension, which consisted of Formalization and its two subscales, Standardization, Autonomy and Centralization, was positively associated with Control Unit ( $r = .548$ ), all three Size measures ( $r \geq .422$ ), Number of Programs ( $r = .702$ ) and Type of Institution ( $r = .413$ ). These figures indicated that the number of provisions to control behavior seemed to be greater in larger institutions and in institutions that were directly under government control.

The Behavior Control dimension was positively associated with Flexibility ( $r = 1.000$ ), Open Door ( $r = .493$ ) and Educational Leave ( $r = .729$ ). It was negatively associated with Option in Selection of Students (negative,  $r = .457$ ). The variables Open Door, Option in Selection of Students and Flexibility intercorrelated and appeared to separate the private colleges from the other institutions in the study. An affirmative score on Flexibility and Open Door and a zero score on Option in



Table 14

Pearson Product-Moment Correlation Coefficients Between Structural Dimensions and Continuous Contextual Variables (n=23)

Dimension	Age	Control Unit	Size-Admin, Instructors	Size-Employee	Size-FTE	No. Programs	Variation Teach. Groups	Scheduling Block	Technical Innovations	Select. Students (Int)	Select. Students (WTest)	Population	Dependence	No. Financial Inputs	Enrollment Change	Direction Enrol. Change	Type of Institution	Community Support	Stud:Instructor Ratio	Stud:Administrator Ratio	Stud:Employee Ratio
Behavior Control	.103	.548	.461	.482	.422	.702	-.251	.357	.304	-.304	.409	.137	.401	-.247	.091	.262	.413	-.277	-.243	.083	-.178
Role Structure	-.303	.003	.229	.246	.183	.121	.210	-.063	.425	-.246	-.020	-.226	-.226	.039	.252	.196	-.349	.162	.287	-.189	.157



Selection of Students was typical of public institutions. The relationships of these three variables with the Behavior Control dimension indicated that there were more behavior control provisions in public institutions than in private institutions.

Table 15

Brogden Correlation Coefficients Between Structural Dimensions and Dichotomous Contextual Variables (n=23)

	Found- ing	Flexib- ility	Open Door	Loca- tion	Option Sel. Stu- dents	Turn- over	Ed. Leave
	(-)				(-)		
Behavior Control	.057	1.000	.493	.389	.457	.304	.729
	(-)						
Role Structure	.215	.523	.096	.126	.193	.379	.227

The association between Behavior Control and Educational Leave ( $r = .729$ ) could be explained by an examination of the institutions lacking educational leave provisions. Two were private colleges which generally scored low on the variables related to Behavior Control. Three of the four public colleges without educational leave provisions were new and had low scores on the variables forming the Behavior Control dimension.

The Role Structure dimension, which consisted of Specialization, Chief Executive Span, Subordinate Ratio, Percentage of Superordinates and Percentage of Clerks, was concerned with the shape of the role structure of the institution and gave an indication of the degree of



functional differentiation. Only the variable Technical Innovations was positively associated with the Role Structure dimension ( $r = .425$ ). Size was not related to Role Structure. Flexibility had a positive relationship with Role Structure but this variable also had positive relationships with ten of the twelve structural variables so should be viewed with some caution.

### SUMMARY

Six contextual variables, Flexibility, Number of Programs, Educational Leave, Control Unit, Open Door and Option in Selection of Students, were associated with five or more of the twelve structural variables. Flexibility was associated with all of the structural variables except Subordinate Ratio and Percentage of Non-workflow Personnel. Number of Programs was associated with the six variables, Formalization, Documents, Recording of Role Performance, Standardization, Autonomy and Centralization. Control Unit was associated with these same structural variables with the exception of Documents.

The only structural variable that all three Size measures were associated with was Standardization. Size in terms of Instructors and Administrators and Size in terms of Employees were both positively associated with Centralization. Type of Institution was positively associated with Centralization and Percentage of Non-workflow Personnel. Location was associated with these





same two variables. Technical Innovations was positively associated with Specialization but was negatively associated with Chief Executive Span.

Six contextual variables, Age, Population, Dependence, Direction of Enrolment Change, Community Support and Students to Employee Ratio, were each associated with one structural variable. Four other contextual variables, Variation in Teaching Groups, Number of Financial Inputs, Enrolment Change and Founding, were not associated with any structural variables.

The contextual variables, Flexibility, Educational Leave, Number of Programs, Control Unit, all three Size measures and Open Door, were all positively associated with the Behavior Control dimension. Option in Selection of Students was negatively associated with this dimension. The contextual variables Flexibility and Technical Innovations were both positively associated with the Role Structure dimension. None of the Size measures was associated with the Role Structure dimension.



## Chapter 8

### SUMMARY, CONCLUSIONS AND IMPLICATIONS

#### SUMMARY

The purpose of the study was to describe the internal organizational structures of the one-year and two-year post-secondary educational institutions in Alberta and in British Columbia and to investigate relationships between structure and variables both in the institution and in the environment that may influence structure.

Also, the study was designed to test the applicability of the methodology developed in the Aston studies to the study of the organizational structures of institutions serving the same function or similar functions; specifically, post-secondary educational institutions.

#### Structure

Wide variations were found for all structural variables. For the variables measured by scales, Specialization, Formalization, Documents, Recording of Role Performance, Standardization and Autonomy, the scores approached or achieved the maximum and minimum values possible. The scores on the Centralization scale ranged from 49 to 78 out of a possible 78. For the five structural variables not measured by scales, wide variations



were found. For example, Chief Executive Span ranged from 2 to 36 and Percentage of Non-workflow Personnel ranged from 14 percent to 56 percent.

Factor analysis revealed two underlying dimensions of structure in the institutions in the study. The first dimension was designated Behavior Control since the variables loading on this factor were concerned with characteristics or measures designed to increase the predictability of the behavior of the participants. The variables loading on this factor were Formalization, Documents, Recording of Role Performance, Standardization, Autonomy and Centralization.

The second dimension was concerned with the role structure and the degree of functional specialization and was identified as the Role Structure dimension. The variables loading on this factor were Specialization, Chief Executive Span, Percentage of Clerks, Subordinate Ratio and Percentage of Superordinates.

Wide variations were found in factor scores on each factor. The standardized factor scores for the Behavior Control dimension ranged from 26 to 66 (mean 50 and standard deviation 15). Wider variation was found in the Role Structure dimension on which the factor scores range from 3 to 81.



## Context

Variations were found on all thirty contextual variables although two, Supply of Instructors and Program Length, were poor discriminators and so were omitted from the analyses. Those variables scored in categories, such as Age, Number of Financial Inputs and Enrolment Change, generally achieved maximum and minimum values. Variables that were scored as absolute numbers showed wide variation. For example, the variable Size, measured in terms of student enrolment, ranged from 143 to 4469 and the Students to Employee Ratios ranged from 3 to 17 students for each employee.

Some of the contextual variables formed clusters around the variables Control Unit and Size. The variables Location, Age, Flexibility, Type of Institution, Educational Leave, Number of Programs, Number of Financial Inputs and Ratios of Students to Instructor, Students to Administrator and Students to Employee all were associated with Control Unit. The contextual variables associated with Size were Number of Programs, Flexibility, Founding, Technical Innovations, Turnover and Educational Leave. No strong interrelationships were found among the variables clustering around either Control Unit or Size indicating that the contextual variables tended to vary independently.

## Relationships Between Context and Structure

Relationships were found between contextual vari-





ables and structural variables. Flexibility was associated with ten of the twelve structural variables; it was not associated with Subordinate Ratio and Percentage of Non-workflow Personnel. Number of Programs was associated with the structural variables Formalization, Documents, Recording of Role Performance, Standardization, Autonomy and Centralization. Control Unit was associated with these structural variables also, with the exception of Documents.

The only structural variable that all three Size measures were associated with was Standardization. Size in terms of Instructors and Administrators and Size in terms of Employees were both associated with Centralization. Size was not associated with the remaining structural variables. Age was associated with Percentage of Non-workflow Personnel but was associated with no other structural variables.

Location was positively associated with Centralization and Percentage of Non-workflow Personnel. These were the only structural variables that differed on a provincial basis. Technological Innovations was positively associated with Specialization and negatively associated with Chief Executive Span.

Four contextual variables, Founding, Variation in Teaching Groups, Enrolment Change and Number of Financial Inputs, were not associated with any structural variables.



Flexibility and Number of Programs had the strongest relationships with the Behavior Control dimension. Both relationships were positive. All three Size measures, Open Door and Educational Leave were all positively related to Behavior Control and Option in Selection of Students was negatively related to Behavior Control.

Only two contextual variables, Flexibility and Technical Innovations, were associated with the Role Structure dimension. Both of these relationships were positive.

### CONCLUSIONS

The preceding section was concerned with the descriptive aspects of the study. Since one purpose of the study was to test the applicability of the Aston methodology to relatively small institutions serving a similar function, this section is concerned with the methodological aspects of the study.

The findings of the study discussed above indicate that the Aston methodology can be adapted to the study of organizational structures of educational institutions with as few as forty paid employees. The abbreviated form of the Aston interview schedule, with slight modifications, has sufficient discriminating power to be used to study such institutions.

One problem in the Aston methodology is the validation of the data. In this study the data were collected



during interviews with the chief executive officer of each institution. Efforts were made to validate the data in two ways. As far as possible, the data were checked by comparison with handbooks, policy manuals and other documents in the institutions. Second, the data were shown to the superordinate of each group of institutions for verification. However, both methods of validation have weaknesses. First, all information requested in the interviews were not covered in documents in the institutions. Second, the superordinates did not have a sufficiently detailed knowledge of the structures of the institutions to be able to verify the data in detail. They were only able to indicate that the data appeared to be generally accurate. It is likely that a similar problem would exist if the chairman of the college council were interviewed. If employees in the institution below the chief executive officer were interviewed, they may not be familiar with all aspects of the institution covered in the interview schedule. Thus, while the data gathering is economical in terms of time, these data are difficult to validate.

A limitation of the Aston methodology was discussed in Chapter 4. The view of the organization given by the data is the formal structure; that is, what is expected to occur. However, the existence of a document does not guarantee its use. How the organization operates in practice may differ from what is indicated in the data.



A third possible weakness of the Aston methodology is the representativeness of the items in the scales. This may be a greater problem in the Aston scales than in other instruments such as Hall's due to the specificity of the items. An institution may be highly centralized in terms of the eighteen decisions on the Centralization Scale, yet may have appeared to be relatively decentralized had different decisions been included in the scale. However, claims cannot be made either for or against the representativeness of the items since the population of possible items is not known.

### IMPLICATIONS

The findings and conclusions of the study suggested implications for practice and for further research.

#### Implications for Practice

An implication of the bureaucratic nature of the organizational structures of the institutions in the study, particularly the centralization of decision making, is that conflict may develop between the faculty and both the administration and the college council. At least ten of the eighteen decisions in the Centralization Scale could be made by faculty committees or joint faculty-administration committees, yet only three decisions were commonly made at levels below the president/principal. If an adversary system is to be avoided, some alternate form of governance





to that currently in existence should be developed.

A second implication arises from the annual faculty turnover in the institutions. Fifteen of the twenty-three institutions had an annual turnover of five percent or less. This low turnover may result in a lack of infusion of new ideas once the initial growth period has ended. Steps may be necessary to ensure that faculty members continue to grow academically through in-service work or other means.

### Implications for Further Research

This study has shown that the Aston methodology is applicable to studies of the organizational structures of educational institutions. Previous research has demonstrated the applicability of the Hall approach to the study of educational institutions. Comparative studies of educational institutions should now be undertaken to determine whether the Aston and Hall approaches give different views of the organization. That is, comparative studies would reveal whether the perceptions of the organization of the chief executive officer and the other participants in the organization differ.

This study has provided a description of the organization structures of the post-secondary educational institutions and has shown that relationships exist between structural variables and some contextual and environmental variables. Studies can now be undertaken to determine what



relationships exist between variations in structure and variations in behavior in these institutions.

A methodological study could be undertaken in which several levels of participants both above and below the chief executive officer were interviewed in addition to the chief executive officer. Such a study may reveal an effective and parsimonious method of validating the data gathered from the chief executive officer.

While there were eight contextual variables that were related to the Behavior Control dimension only two variables, Flexibility and Technical Innovations, were related to the Role Structure dimension. Studies using contextual variables, particularly environmental variables, should be undertaken in an effort to discover what, if any, contextual variables may explain variations among the institutions on the Role Structure dimension.



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## APPENDICES



APPENDIX A  
INTERVIEW SCHEDULE



Department of Educational Administration  
University of Alberta

Interview Schedule\*  
of  
Selected Organization-Level Information

INSTITUTION: \_\_\_\_\_

INTERVIEWEE: \_\_\_\_\_

DATE: \_\_\_\_\_

\*Adapted from the Interview Schedule developed at the  
Industrial Administration Research Unit, University  
of Aston in Birmingham, England.





ORIGIN AND HISTORY

---

COULD YOU TELL ME SOMETHING ABOUT THE ORGANIZATION'S  
HISTORY?

WHEN IT BEGAN?

WHO PROVIDED THE IMPETUS FOR ITS FOUNDING? (SOME INDIVIDUAL  
SOME GOVERNMENT LEGISLATION?)

---

11.01 The organization was founded by: \_\_\_\_\_

---

11.02x Date of foundation of the organization was: \_\_\_\_\_

---



OWNERSHIP AND CONTROL

---

WHAT TYPE OF CONTROLLING BOARD HAS THE INSTITUTION?

---

12.70x Check the appropriate response:

Elected School Board \_\_\_\_\_

Board of Representatives of School Boards \_\_\_\_\_

Combination of Elected and Appointed  
Representatives \_\_\_\_\_

Appointed Board \_\_\_\_\_

Government Department \_\_\_\_\_

Other \_\_\_\_\_

---

LOCATION

---

IN WHICH PROVINCE IS THE INSTITUTION LOCATED?

WHAT IS THE APPROXIMATE TOTAL POPULATION OF THE AREA SERVED?

---

16.70x Circle:      Alberta      B. C.

---

16.71x Total population of area served: \_\_\_\_\_

---



PROGRAMS (CHARTER)

WHAT PROGRAMS ARE OFFERED, WHAT ARE THE CURRENT ENROLMENTS  
IN THE PROGRAMS AND WHAT IS THE LENGTH OF EACH PROGRAM?

14.02 13.70x 14.04	PROGRAM	LENGTH	ENROLMENT
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			



PROGRAMS (CHARTER) Flexibility

---

DO YOUR PROGRAMS CONTAIN OPTIONS TO MEET PARTICULAR NEEDS  
AND/OR INTERESTS OF THE STUDENTS?

DO YOU OFFER PROGRAMS REQUESTED BY SOME SEGMENT OF THE  
COMMUNITY, INCLUDING INDUSTRY? (Minimum 8 weeks, offered  
within the last year or definitely planned for this year)

---

14.06 Circle

Standard programs	1
Standard programs with standard options	2
Standard programs with "free" options	3
Programs requested by outside agencies	4

---





TECHNOLOGY

---

15.70x Teaching groups:

large (50+)	_____	seminars	_____
class (20-40)	_____	tutorials	_____
class (15)	_____	MOST COMMON	_____

---

## 15.71x Length of Programs:

Longest	_____
Shortest	_____
Most Frequent	_____

---

## 15.72x Normal Scheduling Block:

Quarter	_____
Semester	_____
Year	_____

---

## 15.73x Technological Devices:

Teaching Teams	_____
T. V.	_____
C. A. I.	_____
Programmed Instruction	_____
Other _____	_____

---



TECHNOLOGY


---

15.74x Is there an open door policy to the institution?

---

What percentage of incoming students initially  
enrol in the transfer program?

---

What is the overall completion rate by programs?

Program	Rate
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

---

TECHNOLOGY (WORKFLOW INTEGRATION: EVALUATION)

---

IS THE QUALITY OF INCOMING STUDENTS MEASURED?

---

15.75x Selection based on records and interview  
with counselor.

---

Selection based on records, interview  
with faculty in addition to counselor.

---

Selection as above plus one or more  
written tests.

---



SIZE

---

13.01x Total number of professional administrative  
staff (full time equivalents) \_\_\_\_\_

Total instructional staff (include part-  
time as half) \_\_\_\_\_

Total professional staff not above  
(librarians, counselors, etc) \_\_\_\_\_

Total paraprofessional staff (instructional) \_\_\_\_\_

Total non-instructional staff (excluding  
all those already accounted for) \_\_\_\_\_

Grand Total \_\_\_\_\_

---



ORGANIZATION CHART

---

Obtain any chart that is available. Add to it, or if no chart, sketch one, should this be necessary to obtain adequate information.

55.08

55.43 How much of total organization is included? \_\_\_\_\_

55.47

53.01 Copies are given to: \_\_\_\_\_

\_\_\_\_\_





SUBORDINATE RATIO, etc

---

HOW MANY OF THE FOLLOWING ARE THERE? - Time Allowed?  
(include counseling department)

Time

55.09x Total number of department chairmen	_____	_____
division chairmen	_____	_____
program chairmen	_____	_____
other	_____	_____

Total number reporting directly to them?  
(include instructors and paraprofessionals)

\_\_\_\_\_

---

% CLERKS

---

55.49 Total number of clerical workers  
(non-supervisory, include library  
clerks)

\_\_\_\_\_



SPECIALIZATION OF FUNCTIONS

In order for a specialism to exist at least one person in the organization must devote at least half time to the given special function.

51.01x Item No.	WHO IS RESPONSIBLE FOR:	HALF-TIME (CIRCLE) OR FULL-TIME (BOX)
7	OBTAINING AND CONTROLLING MATERIALS AND EQUIPMENT  Buying _____ Stores _____ Stock Control _____	YES NO
9	RECORDING AND CONTROLLING FINANCIAL RESOURCES  Accounting clerk _____ Salary officer _____	YES NO
8	MAINTAINING BUILDINGS AND EQUIPMENT  Custodians _____ Other _____	YES NO
11	CONTROLLING THE QUALITY STANDARDS FOR VARIOUS PROGRAMS (i.e. measuring incoming students)  Screening incoming students _____ Determining final standings _____	YES NO



SPECIALIZATION OF FUNCTIONS (continued)

51.01x Item No.	WHO IS RESPONSIBLE FOR:	HALF-TIME (CIRCLE) FULL-TIME (BOX)
6	MAINTAINING HUMAN RESOURCES AND PROMOTING THEIR INDENT- IFICATION WITH THE ORGANIZ- ATION  Canteen Services _____ Student Union Sponsor _____	YES NO
10	CONTROLLING WORKFLOW  Long-term planning _____	YES NO
2	DISPOSING OF AND DISTRIB- UTING OUTPUT  Placement of students _____ Follow-up _____ Vocational counselor _____ Liason with University _____	YES NO
4	AQUIRING AND ALLOCATING HUMAN RESOURCES  Hiring staff _____	YES NO
13	DEVISING NEW PROGRAMS, COURSES  Program development _____	YES NO



SPECIALIZATION OF FUNCTIONS (continued)

51.01x Item No.	WHO IS RESPONSIBLE FOR:	HALF-TIME (CIRCLE) OR FULL-TIME (BOX)
14	DEVELOPING AND OPERATING ADMINISTRATIVE PROCED- URES  Organization and Methods _____  Statistics collection and analysis _____  Records _____	YES NO
5	SALES TO PARTICIPANTS  Book store manager _____	YES NO
1	DEVELOPING, LEGITIMIZING AND SYMBOLIZING THE ORGANIZATION'S CHARTER  Public relations _____  Advertising _____	YES NO
16	ACQUIRING INFORMATION ON THE OPERATIONAL FIELD  Search for employer needs _____  Search for community needs _____  Institutional research _____	YES NO





ARE THE FOLLOWING DOCUMENTS AVAILABLE? (obtain copies)

53.01 Item No.	DOCUMENTS	
1,2	Written CONTRACTS OF EMPLOYMENT _____	
3,4,5	INFORMATION BOOKLETS On general topics List titles e.g. pensions  _____ Categories of employees given booklets. _____ _____	
6,7,8,9	Total number of different kinds of information booklets: _____	
11,12,13	ORGANIZATION CHART	YES NO
16,17, 18,19	Written terms of reference or JOB DESCRIPTIONS for: Paraprofessionals YES NO Instructors YES NO Administrators (including chairmen) YES NO Support Personnel (clerical, etc) YES NO Chief Executive YES NO	
20	MANUAL OF PROCEDURES (or standing orders)	YES NO
21	Written STATEMENT OF POLICIES	YES NO
23	Written SCHEDULE	YES NO
15	Written COURSE OUTLINES Available	YES NO



FORMALIZATION

53.03 Item No.	RECORDING OF ROLE PERFORMANCE			
22	Preview of courses	YES	NO	
23	Written application form to spend \$100	YES	NO	
24	Requisition for engaging an instructor	YES	NO	
24x	Requisition for engaging a non- professional employee	YES	NO	
25	Application form for an instructor	YES	NO	
35	Record of instructor's performance (inspection report)	YES	NO	
36	Record of maintenance work done	YES	NO	
37	Record of courses given by instructors	YES	NO	
39	Petty cash vouchers	YES	NO	
55	Sickness (absence) record	YES	NO	



STANDARDIZATION

52.02 Item No.	Standardization of Procedures Controlling Selection and Advancement								
64	Inspection of outputs (as a reflection of the instructor's work) <table> <tr> <td>personal evaluation by the instructor only</td><td>0</td></tr> <tr> <td>across course evaluation through common exams</td><td>1</td></tr> <tr> <td>submission of grades to chairman/committee for approval</td><td>2</td></tr> <tr> <td>submission of grades to administration for approval</td><td>3</td></tr> </table>	personal evaluation by the instructor only	0	across course evaluation through common exams	1	submission of grades to chairman/committee for approval	2	submission of grades to administration for approval	3
personal evaluation by the instructor only	0								
across course evaluation through common exams	1								
submission of grades to chairman/committee for approval	2								
submission of grades to administration for approval	3								
57	Scheduling - pacing <table> <tr> <td>by individual instructor</td><td>0</td></tr> <tr> <td>by agreement among instructors</td><td>1</td></tr> <tr> <td>specified by chairman, committee or admin.</td><td>2</td></tr> </table>	by individual instructor	0	by agreement among instructors	1	specified by chairman, committee or admin.	2		
by individual instructor	0								
by agreement among instructors	1								
specified by chairman, committee or admin.	2								
67	Definition of tasks <table> <tr> <td>intuition and experience of instructor</td><td>0</td></tr> <tr> <td>oral instructions by chairman</td><td>1</td></tr> <tr> <td>oral instructions by administration</td><td>2</td></tr> <tr> <td>written instructions specifying tasks</td><td>3</td></tr> </table>	intuition and experience of instructor	0	oral instructions by chairman	1	oral instructions by administration	2	written instructions specifying tasks	3
intuition and experience of instructor	0								
oral instructions by chairman	1								
oral instructions by administration	2								
written instructions specifying tasks	3								
41	Standard dismissal procedure <table> <tr> <td>YES</td><td>NO</td></tr> </table>	YES	NO						
YES	NO								
6	Staff establishment set by enrolment <table> <tr> <td>YES</td><td>NO</td></tr> </table>	YES	NO						
YES	NO								



STANDARDIZATION (continued)

52.02 Item No.				
8	Recruitment procedures			
	none			0
	some positions			1
	all positions			2
9	Centralized recruiting procedure - all done through the administration or personnel officer.		YES	NO
13	Centralized interviewing procedure for hiring faculty		YES	NO
9,10 11	Selection of employees	Instructor	Chairman	Admin
	by faculty committee	0	0	0
	by mixed committee*	1	1	1
	by administration	2	2	2
	by outside appointer	3	3	3
	*faculty and administration			
60	Basis for managerial decisions - how one goes about getting a decision from the administration.			
	ad hoc - no specified procedure		YES	NO
	procedure for some circumstances		YES	NO
	standard procedure		YES	NO
	submit a case in written form		YES	NO





STANDARDIZATION (continued)

52.02 Item No.	
61	Conveying decisions  ad hoc YES NO  sometimes a procedure is used YES NO  always a procedure is used YES NO
52	Intensity of inspection of instructor performance  none 0  as required (for tenure, etc) 1  random 2  regular 3
44	Ordering procedures based on  ad hoc 0  production plans (projected enrolment) 1  stock on hand 2



AUTHORITY (CENTRALIZATION) 54.00

WHO HAS THE AUTHORITY TO DECIDE? (Authority means that action can be taken on the decision even though the decision may be subject to routine ratification).

Item	Decision	Decision Maker
5	SUPERVISORY ESTABLISHMENT	
6	APPOINTMENT OF SUPERVISORY STAFF FROM OUTSIDE THE ORGANIZATION	
7	PROMOTION OF SUPERVISORY STAFF	
8	SALARIES OF SUPERVISORY STAFF	
31	TO DISMISS A SUPERVISOR	
2x	SELECT FACULTY MEMBERS	
17	DETERMINE THE ATTENDANCE AREA	
16	DETERMINE A NEW PROGRAM OR SERVICE	
43	FEE STRUCTURE	
13	TYPE AND BRAND OF EQUIPMENT TO BE PURCHASED	



AUTHORITY (continued)

Item	Decision	Decision Maker
28	METHODS OF WORK TO BE USED	
30	ALLOCATION OF WORK AMONG AVAILABLE PERSONNEL	
34	ADMISSION STANDARDS FOR STUDENTS	
40	WHAT AND HOW MANY WELFARE FACILITIES ARE TO BE PROVIDED	
9	TO SPEND UNBUDGETTED OR UNALLOCATED MONEY ON CAPITAL ITEMS	
10	TO SPEND UNBUDGETTED OR UNALLOCATED MONEY ON REVENUE ITEMS	
44	ASSIGNMENT OF RESPONSIBILITIES TO PARAPROFESSIONALS	
46	CREATION OF A NEW DEPARTMENT	



TASK ENVIRONMENT

---

71.01 Financial Inputs

%

1 Chief source

2 Secondary source

3 Other sources

---

71.02 Option in Selection of Students1 Can you be selective in admitting students  
to the institution?

YES NO

2 Criteria used?

---

71.03 Manpower (Instructional staff)

1 Is there an adequate supply of instructors? YES NO

2 Is the staff stable?

YES NO

3 What was the turnover last year?

\_\_\_\_%

If abnormal, what is the normal turnover?

\_\_\_\_%

4 Is there a tendency for those that leave  
to enter a particular occupation?

YES NO

5 What occupation(s)?

6 Do those leaving for academic upgrading  
return to the institution?

\_\_\_\_%

7 What arrangements are made for sabbatical  
leave?8 How many instructors take advantage of the  
sabbatical leave provisions?

\_\_\_\_%





TASK ENVIRONMENT (continued)

---

71.04 Stability of Environment

- 1 Has overall enrolment risen, declined or remained relatively constant over the last three years? \_\_\_\_\_

Enrolments: 1970-1971 \_\_\_\_\_

1969-1970 \_\_\_\_\_

1968-1969 \_\_\_\_\_

- 2 Has there been a shift in enrolment patterns over the last 3-5 years? YES NO

Direction: \_\_\_\_\_

---

71.05 Support from Community (hostile-benign)

- 1 Are any programs and necessary standards of student achievement dictated by outside organizations? YES NO

Organization _____	Program _____
_____	_____
_____	_____

- 2 Is pressure exerted on the institution by organizations, apart from controlling agencies and those listed above? YES NO

religious \_\_\_\_\_ business \_\_\_\_\_

unions \_\_\_\_\_ professional groups \_\_\_\_\_

other \_\_\_\_\_

- 3 Are there advisory committees? YES NO

- 4 Are drives for funds in the community well supported? YES NO

- 5 Are activities put on by the college for community participation well supported? YES NO



APPENDIX B

SCALOGRAMS



		ITEM NUMBERS <sup>1</sup>					SPECIALIZATION					160	
		7	9	11	6	10	2	4	13	14	5	16	
Mount Royal		*	*	*	*	*	*	*	*	*		*	10
Red Deer		*	*	*	*	*	*	*	*	*		*	10
Douglas		*	*	*	*		*	*		*	*		8
Medicine Hat		*	*	*	*	*	*			*			7
N.A.I.T.		*	*	*	*	*			*		*		7
S.A.I.T.		*	*	*	*	*				*	*		7
Selkirk		*	*	*	*		*	*					6
Trinity		*	*		*	*	*		*				6
B.C.I.T.		*	*	*		*	*		*				6
Capilano		*	*	*	*		*	*					6
Lethbridge		*	*	*		*	*						5
Cariboo		*	*		*		*	*					5
VCC, Langara		*	*	*			*	*					5
Columbia		*	*	*	*								4
Malaspina		*	*	*	*								4
Okanagan		*	*	*				*					4
Fairview		*	*	*		*							4
Olds		*	*	*			*						4
New Caledonia		*		*	*								3
Grand Prairie		*	*					*					3
Camrose		*				*							3
St. Jean		*		*		*							3
Vermilion		*	*			*							3
		23	20	18	13	12	12	9	5	5	3	2	

<sup>1</sup>See Appendix A



## ITEM NUMBERS

		23	1	21	17a	15	11	12	16a	17b	16b	18a	20	
VCC, Langara		*	*	*	*	*	*	*	*	*	*	*	*	12
Red Deer		*	*	*	*	*	*	*	*	*	*	*	*	12
S.A.I.T.		*	*	*	*	*	*	*	*	*	*	*	*	12
N.A.I.T.		*	*	*	*	*	*	*	*	*	*	*	*	11
Grand Prairie		*	*	*	*	*	*	*	*	*		*	*	11
Olds		*	*	*	*	*	*	*	*	*	*	*	*	11
Selkirk		*	*	*	*	*		*	*	*	*		*	10
Vermilion		*	*	*	*	*	*		*		*	*	*	10
Trinity		*	*	*	*	*	*	*		*			*	9
Capilano		*	*	*	*	*	*		*		*	*		9
Fairview		*	*		*	*	*		*		*	*	*	9
Mount Royal		*	*	*	*	*		*	*	*			*	9
Cariboo		*		*	*	*		*	*	*	*	*		9
Lethbridge		*	*		*	*	*	*		*		*		8
Medicine Hat		*		*	*		*	*		*	*	*		8
Malaspina		*	*	*			*	*	*	*	*			8
Douglas		*		*		*	*	*	*	*				7
B.C.I.T.		*	*		*	*	*		*		*			7
Okanagan		*	*				*	*	*	*	*			7
Camrose		*	*	*	*							*		5
Columbia		*		*				*		*				4
St. Jean		*				*							*	3
New Caledonia		*	*	*										3

23 18 18 17 17 16 16 16 16 14 13 10





## RECORDING ROLE PERFORMANCE

## ITEM NUMBERS

162

	25	23	36	55	35	22	24	24x	
Lethbridge	*	*	*	*	*	*	*	*	8
N.A.I.T.	*	*	*	*	*	*	*	*	8
Vermilion	*	*	*	*	*	*	*	*	8
Grand Prairie	*	*	*	*	*		*	*	7
S.A.I.T.	*	*	*	*	*		*	*	7
Fairview	*	*		*	*	*	*	*	7
Olds	*	*	*	*	*		*	*	7
Mount Royal	*	*	*	*	*	*	*		7
Capilano	*	*	*	*	*	*			6
VCC, Langara	*	*	*	*	*	*			6
Cariboo		*	*	*	*	*			5
New Caledonia		*		*	*	*		*	5
Douglas	*	*	*		*	*			5
B.C.I.T.	*	*		*	*				4
Selkirk	*		*		*	*			4
Columbia	*		*	*		*			4
Medicine Hat	*	*		*					3
Malaspina	*		*	*					3
Camrose	*	*	*						3
Okanagan	*	*		*					3
Trinity			*			*			2
Red Deer	*		*						2
St. Jean									0
	19	17	17	17	15	13	8	8	



## ITEM NUMBERS

[illegible]



## AUTONOMY

## ITEM NUMBERS

	2x	43	34	10	46	6	7	9	5	16	31	8	17	43	40	
Columbia	*	*	*	*	*	*	*		*	*	*	*	*	*	*	14
Trinity	*	*	*	*	*	*	*	*	*	*	*	*		*		13
Camrose	*	*	*	*	*	*	*	*	*		*	*				11
St. Jean	*	*	*	*	*			*	*	*		*	*		*	11
New Caledonia	*	*	*	*	*	*	*	*		*		*				10
Cariboo	*	*	*	*	*	*	*		*	*						9
Grand Prairie	*	*	*	*			*	*	*	*	*					9
Malaspina	*	*		*	*	*	*		*		*					8
Mount Royal	*	*			*	*	*			*	*					7
Okanagan	*	*		*		*	*	*				*				7
Douglas	*	*		*		*	*	*	*							7
Red Deer	*	*	*	*				*								5
VCC-Langara					*	*	*			*						4
Medicine Hat	*	*	*		*											4
S.A.I.T.		*	*	*				*								4
Selkirk	*	*	*													3
Lethbridge	*	*	*													3
Capilano	*	*			*											3
N.A.I.T.	*	*		*												3
B.C.I.T.	*		*								*					3
Olds					*	*										2
Fairview	*															1
Vermilion																0

---

19 18 13 13 12 11 11 9 8 8 7 6 2 2 2

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### ITEM NUMBERS

[illegible]



CENTRALIZATION  
ITEM NUMBERS

	16d	46d	16e	34c	5e	16e	9e	6e	7e	34d	17f	34a	10e	46e	43f	16f	6f	40f	9f	8f	7f	5f	31f	46f	34f	44f	
Fairview	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	78
Vermillion	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	78
N.A.I.T.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	76
Olds	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	74
S.A.I.T.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	72
B.C.I.T.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	72
Lethbridge	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	64
Capilano	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	64
Mount Royal	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	62
Selkirk	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	62
Red Deer	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	61
V.C.C. Langara	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	61
Medicine Hat	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	60
Malaspina	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	60
Douglas	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	58
Cariboo	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	57
Okanagan	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	57
New Caledonia	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	56
Grand Prairie	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	53
St. Jean	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	52
Trinity	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	50
Camrose	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	50
Columbia	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	49

167

18 17 16 15 15 15 14 12 12 12 12 11 10 10 10 8 7 6 6 6 6 6 6 5 4 4



## ITEM NUMBERS

168

		5a	5b	3	1a	1b	4a	4b	
Grand Prairie		*	*	*	*	*	*	*	7
Red Deer		*	*	*	*	*	*	*	7
Camrose		*	*	*	*		*	*	6
St. Jean		*	*	*	*	*	*		6
VCC, Langara		*	*	*	*	*			5
B.C.I.T.		*	*	*			*	*	5
New Caledonia		*	*	*	*	*			5
Lethbridge		*	*	*			*	*	5
Medicine Hat		*	*		*		*	*	5
Malaspina		*	*	*	*	*			5
Okanagan		*	*	*	*	*			5
Selkirk		*	*	*	*	*			5
Trinity		*	*				*	*	4
Capilano		*		*	*	*			4
Mount Royal		*	*	*					3
Cariboo				*	*	*			3
N.A.I.T.		*	*	*					3
S.A.I.T.		*	*	*					3
Fairview		*	*		*				3
Olds		*	*	*					3
Vermilion		*	*	*					3
Douglas				*	*				2
Columbia		*	*						2

21 20 19 14 10 8 7



APPENDIX C  
STRUCTURE SCORES





Table 16

## Scores of Institutions on Structural Variables

	Specializ- ation	Documents	Recording Role Perform.	Formaliz- ation	Standard- ization	Centraliz- ation	Autonomy
Capilano	6	9	6	15	10	64	6
Cariboo	5	9	5	14	14	57	12
New Caledonia	3	3	5	8	12	56	13
Douglas	8	7	5	12	13	58	10
Malaspina	4	8	3	11	10	60	11
Okanagan	4	7	3	10	16	57	10
Selkirk	6	10	4	14	11	62	6
VCC, Langara	5	12	6	18	14	61	7
Columbia	4	4	4	8	6	49	17
Trinity	6	9	2	11	7	50	16
B.C.I.T.	6	7	4	11	20	72	6
Grand Prairie	3	11	7	18	14	53	12
Lethbridge	5	8	8	16	14	64	6
Medicine Hat	7	8	3	11	13	60	7
Mount Royal	10	9	7	16	14	63	10
Red Deer	10	12	2	14	13	61	8
Canrose	3	5	3	8	7	50	14
St. Jean	3	3	0	3	6	52	14
N.A.I.T.	7	11	8	19	12	76	6
S.A.I.T.	7	12	7	19	17	72	7
Fairview	4	9	7	16	14	78	4
Olds	4	11	7	18	13	74	5
Vermilion	3	10	8	18	12	78	3
Mean	5.35	8.43	4.96	13.39	12.26	62.04	9.13
S.D.	2.10	2.71	2.25	4.28	3.45	9.04	3.92
Range	10-3	12-3	8-0	19-3	20-6	78-49	17-3
Total Possible	11	12	8	20	22	78	18



Table 17

## Scores on Five Configuration Variables

	ChiefEx Span	Subordin- ate Ratio	%Clerks	%Non- Workflow	%Super- ordinate
Capilano	6	15	14	17	6
Cariboo	4	8	17	22	9
New Caledonia	36	33	18	22	2
Douglas	7	5	17	26	10
Malaspina	6	15	17	20	6
Okanagan	7	9	17	30	7
Selkirk	5	5	9	26	9
VCC, Langara	2	26	11	14	3
Columbia	32	5	10	24	3
Trinity	4	3	11	56	4
B.C.I.T.	8	8	11	21	6
Grand Prairie	6	6	22	35	10
Lethbridge	10	9	14	42	4
Medicine Hat	4	6	31	35	9
Mount Royal	4	13	17	37	5
Red Deer	5	11	22	32	7
Camrose	5	21	13	31	8
St. Jean	7	6	7	34	5
N.A.I.T.	2	10	17	26	7
S.A.I.T.	4	9	26	39	7
Fairview	22	15	8	55	4
Olds	12	5	13	43	6
Vermilion	25	23	9	54	3
Mean	9.70	11.57	15.26	32.22	6.09
S.D.	9.52	7.72	5.93	11.86	2.37
Range	36-2	33-3	31-7	56-14	10-2



Table 18

Responses of Each Institution to Each  
Decision in the Centralization Scale<sup>1</sup>

	Item																	
	5	6	7	8	31	2x	16	17	43	13	28	30	34	40	9	10	44	46
Capilano	5	5	5	5	5	4	5	5	5	3	1	3	5	5	5	5	3	4
Cariboo	4	4	4	5	5	3	3	5	5	3	1	3	4	5	6	3	3	4
New Cal- edonia	4	4	4	4	5	4	5	5	5	1	1	3	3	5	4	4	1	4
Douglas	5	4	4	5	5	4	4	5	5	3	3	3	5	5	3	3	3	5
Malaspina	5	4	4	5	4	4	4	6	5	1	1	3	5	5	5	4	3	4
Okanagan	5	4	4	4	5	4	5	5	5	1	2	3	5	5	4	4	3	2
Selkirk	5	5	5	5	5	3	5	5	5	3	1	3	2	5	5	5	3	5
VCC, Lang. <sup>2</sup>	4	4	4	5	5	5	5	5	5	5	1	2	5	5	5	5	1	4
Columbia	4	4	4	4	4	4	4	4	3	1	1	3	3	3	5	4	1	3
Trinity	4	4	4	5	4	3	3	5	3	1	1	3	2	5	4	4	1	3
B.C.I.T.	6	6	6	6	4	3	6	6	6	6	3	3	2	6	6	6	3	6
Grand Prairie	4	4	5	5	3	3	3	5	6	1	1	3	2	5	3	3	3	5
Leth- bridge	5	5	5	5	5	2	6	6	5	1	1	3	2	5	5	5	1	5
Medicine Hat	5	5	5	5	5	4	5	6	5	1	1	3	2	5	5	5	3	2
Mount Royal	4	4	4	5	4	3	6	6	5	1	1	3	5	5	5	5	3	4
Red Deer	5	5	5	5	5	4	5	6	5	2	2	3	2	5	4	4	3	5
Camrose	5	4	4	4	4	3	2	5	5	1	1	3	2	5	4	4	1	2
St. Jean	3	6	6	4	6	4	3	3	6	1	1	4	3	3	3	3	1	3
N.A.I.T.	6	6	6	6	6	3	6	6	6	3	1	3	6	6	6	4	3	6
S.A.I.T.	6	6	6	6	6	6	6	6	6	3	1	3	4	6	4	4	3	6
Fairview	6	6	6	6	6	4	6	6	6	6	1	4	6	6	6	6	1	6
Olds	6	6	4	6	6	6	6	6	6	6	1	3	6	6	6	6	1	4
Vermilion	6	6	6	6	6	6	6	6	6	6	1	2	6	6	6	6	1	6

<sup>1</sup>Scoring: 1 instructor, 2 faculty committee, 3 administrator, 4 president/principal, 5 board, 6 government department.

<sup>2</sup>VCC-Langara: Director level decisions included with principal.











**B30007**